



Index to the Control Guidance Sheets

HSG193

MAY 1999



COSHH ESSENTIALS
Easy steps to control chemicals

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Chemicals causing harm via skin contact

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Note: Small, medium and large refer to the amounts described in Step 2B, on page 12 of the COSHH essentials booklet.



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Control approach 1



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 1 - general ventilation - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on using general ventilation, and can be applied to a range of tasks involving small, medium or large-scale use of solids and liquids. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

General ventilation

100

General ventilation

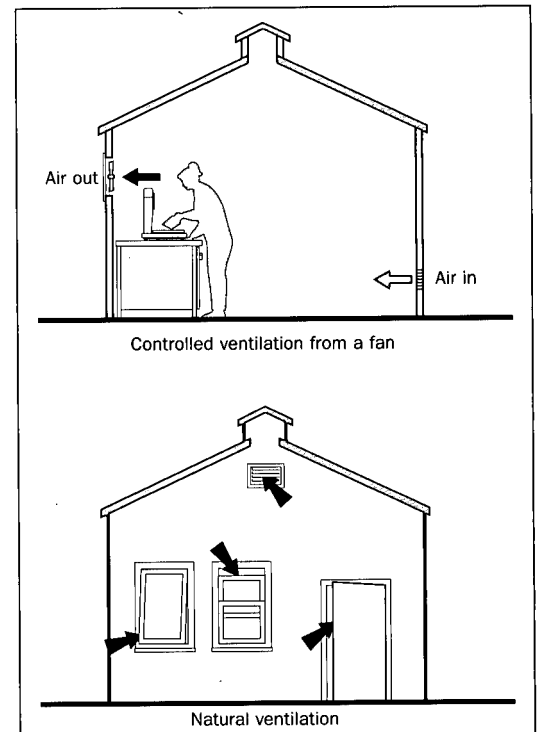
Access

- ✓ Consider restricting access to the working area to those who need to be there.

Design and equipment

- ✓ Provide a good standard of general ventilation. This can be natural ventilation from doors, windows, etc, or controlled, where air is supplied or removed by a powered fan.
- ✓ If you work in a shop or office, natural ventilation will normally be enough to control dusts and vapours from cleaning materials, etc.

- ✓ If you work in a factory, you will normally need controlled general ventilation to remove contaminated air and make it up with clean replacement air. This can be a wall-mounted fan to extract or supply air, with venting through airbricks, grills or louvres, or a more complex ducted air supply and removal system.



- ✓ Ensure that supplied or make-up air comes from an uncontaminated area.
- ✓ Ensure that enough fresh air is supplied to dilute and remove the dust or vapour produced. Between 5 and 15 air changes per hour is recommended.
- ✓ Discharge air away from doors, windows and other air inlets.
- ✓ With dusts, you can re-circulate clean, filtered air into the workroom.
- ✗ With vapours, re-circulation is not recommended.
- ✓ Ensure, where possible, that air comes from a fresh source, flows past the worker and then past the work activity to the extraction point.

Maintenance

- ✓ Maintain the system as advised by the supplier/installer in effective and efficient working order.

Examination and testing (if a ventilation system is provided)

- ✓ Get information on the design performance of the ventilation equipment from the supplier. If this isn't possible, get a competent ventilation engineer to obtain information on the system's optimum performance as part of a thorough examination and test of the system. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week to make sure it's working and hasn't been damaged.
- ✓ Get the ventilation equipment examined and tested against its performance specification.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✗ Don't clean up with a dry brush or compressed air. Vacuum or wet clean.
- ✓ Store containers in a safe place and dispose of empty containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is needed.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✗ Respiratory protective equipment shouldn't be needed for routine tasks.
- ✓ Keep any PPE clean, and replace at recommended intervals.

Training

- ✓ Give workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Controlling airborne contaminants in the workplace* Technical guide no 7 British Occupational Hygiene Society 1987 ISBN 0 905927 42 7.
- Control guidance sheets 101, 102, 103, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the room is well ventilated, and any extraction or air supply is switched on and working.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Don't carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Don't use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb (with granules or mats). For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.



COSHH essentials:
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Control approach 1



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approaches 1 - 3 as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on storing small, medium and large quantities of solids and liquids. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

General storage

General ventilation

101

Access

- ✓ Control entry to the storage area.

Design and equipment

General design aspects

- ✓ Define a specific area for storage and put up clear signs.
- ✓ Ensure the area is spacious, organised, well lit and ventilated.
- ✓ Provide enough space to easily deal with spills.
- ✓ Label all containers, including partly used ones.
- ✓ Floors should be impervious, resistant to liquids and easy to clean.
- ✓ Keep easily ignitable materials, such as empty packaging, in a separate store room and oxidising chemicals in dedicated buildings.
- ✓ Ask your chemical supplier for specific advice on which chemicals to store separately from others (and see the HSE publication HSG71).

Small packages

- ✓ Small packages should be stored in a suitable, robust storage cabinet.
- ✓ Use removable trays within cabinets to contain leaks and spills, and to make cleaning easier.

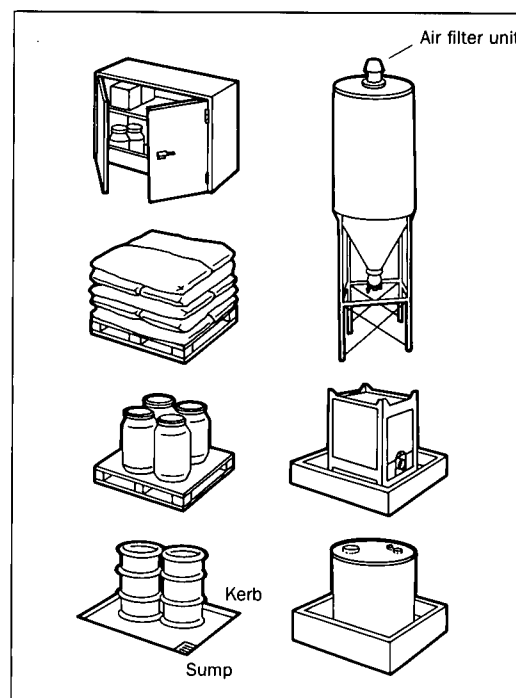
- ✓ Store chemicals that react readily together in separate cabinets.
- ✓ Address flammability hazards if you use refrigerators for storage.

Sacks and drums

- ✓ Make sure spills can be contained, eg by using sump pallets or having kerbed areas.
- ✓ Store chemicals that react readily together at least 3 metres apart.

Silos

- ✓ Provide dust filtration for air displaced from the silo during filling.
- ✓ Put barriers around the silo to prevent damage, eg by fork-lift trucks.
- ✓ Individually label feed lines.
- ✓ Consider the need for explosion relief for combustible solids and ensure that equipment is appropriately earthed.



IBCs (international bulk carriers) and storage tanks

- ✓ Make sure spills can be contained, eg by bunding to hold 110% of the volume of the largest container.

Maintenance

- ✓ Maintain all equipment used in the task as advised by the supplier or installer in effective and efficient working order.
- ✓ Adopt a 'permit to work' system for maintenance work on storage tanks and silos.
- ✓ Follow any special procedures that are needed before opening or entering storage tanks and silos, eg purging and washing.

Examination and testing

- ✓ Inspect the storage area at least once a week for signs of leaks or damage.

Cleaning and housekeeping

- ✓ Clean work equipment and the storage area daily.
- ✓ Deal with spills immediately.
- ✓ Repackage any damaged or leaking packages away from the main storage area, or dispose of them safely.
- ✗ Don't clean up with a dry brush or compressed air. Vacuum or wet clean.
- ✓ Dispose of empty containers safely.
- ✓ Make sure ignition sources such as smoking, electrical power, vehicles and battery charging are tightly controlled.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is needed.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment shouldn't normally be needed for routine tasks. It may be needed for some cleaning and maintenance activities, eg dealing with spills.
- ✓ Keep any PPE clean and replace it as recommended.

Training

- ✓ Give workers information on the harmful nature of the substance.
- ✓ Provide workers with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.
- ✓ Oversee handling of leaks and spills, and disposal of any materials.

Further information

- Safety data sheets.
- *Controlling airborne contaminants in the workplace* Technical guide no 7 British Occupational Hygiene Society 1987 ISBN 0 905927 42 7.
- *Chemical warehousing: the storage of packaged dangerous substances* HSG71 HSE Books 1998 ISBN 0 7176 1484 0.
- *Safe handling of combustible dusts* HSG103 HSE Books 1994 ISBN 0 7176 0725 9.
- Control guidance sheets 103, 204, 302, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any ventilation system is switched on and is working.
- Don't stack materials against air vents, grills, etc. Handle all packages and containers carefully to minimise spills.
- Look for signs of leaks, wear or damage in the storage area. If you find any problems, tell your supervisor. Don't carry on working if you think there is a problem.
- Use handling aids to move sacks and drums.
- Clear up spills straight away. For liquids, contain or absorb spills with granules or mats. For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.
- Wash your hands before and after eating, drinking or using the lavatory.
- Don't use solvents to clean your skin.
- Use, maintain and store any PPE provided in accordance with instructions.



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Open bulk storage

Control approach 1

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This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 1 - general ventilation - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on the open storage of large quantities of solids. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

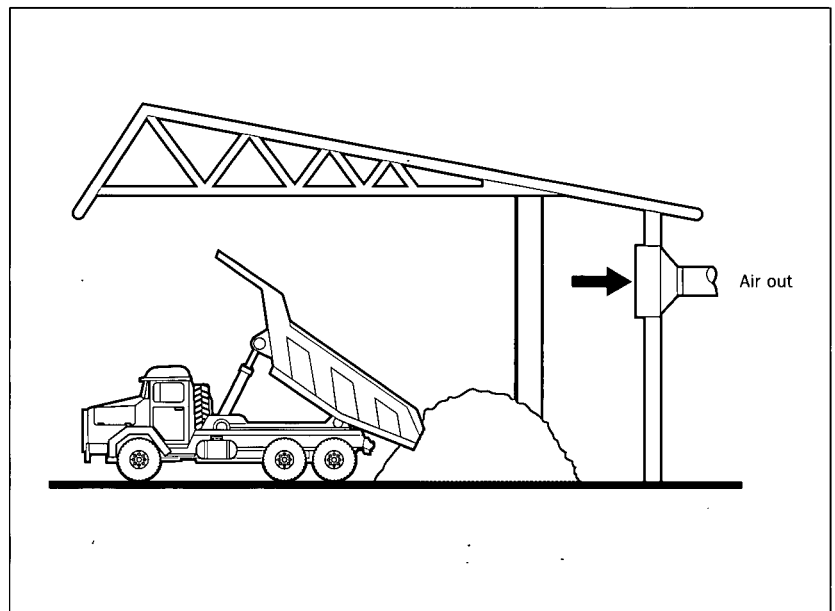
General ventilation

Access

- ✓ Consider restricting access to the storage area to those who need to be there.

Design and equipment

- ✗ Don't have warehouse openings that face into the prevailing wind.
- ✓ Define a specific area for storage and put up clear signs.
- ✓ Position an air extraction system as close as possible to the source of the dust (see the diagram).
- ✓ Clearly segregate different stockpiles.
- ✓ Keep easily ignitable materials, such as empty packaging, in a separate store room.
- ✓ Provide partitions to stop dust spreading through the building.
- ✓ Provide tarpaulins or plastic covers for stockpiles not in use.



Maintenance

- ✓ Maintain all equipment as advised by the supplier/installer, in effective and efficient working order.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area outside the defined storage area daily. Clean other equipment regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✗ Don't clean up with a dry brush or compressed air. Vacuum or wet clean.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is needed.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✗ Respiratory protective equipment shouldn't be needed for routine operations. It may be needed for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep any PPE clean and replace at recommended intervals.

Training

- ✓ Give workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Controlling airborne contaminants in the workplace* Technical guide no 7 British Occupational Hygiene Society 1987 ISBN 0 905927 42 7.
- Control guidance sheets 101, 103, S100 and S101.

Employee checklist for making the best use of the controls

- When moving materials make sure the storage area is well ventilated, and any extraction or air supply is switched on and is working.
- Re-cover stockpiles not in use with tarpaulins/plastic covers where provided.
- When stockpiles aren't in use, keep doors and windows shut whenever possible to prevent draughts and the spread of contamination.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Clear up spills straight away. Use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Removing waste from a dust extraction unit

Control approach 1

General ventilation

103



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 1 - general ventilation - as the suitable approach for your chemical(s) and task(s).

This sheet provides advice on removing waste from a dust extraction or air cleaning unit. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

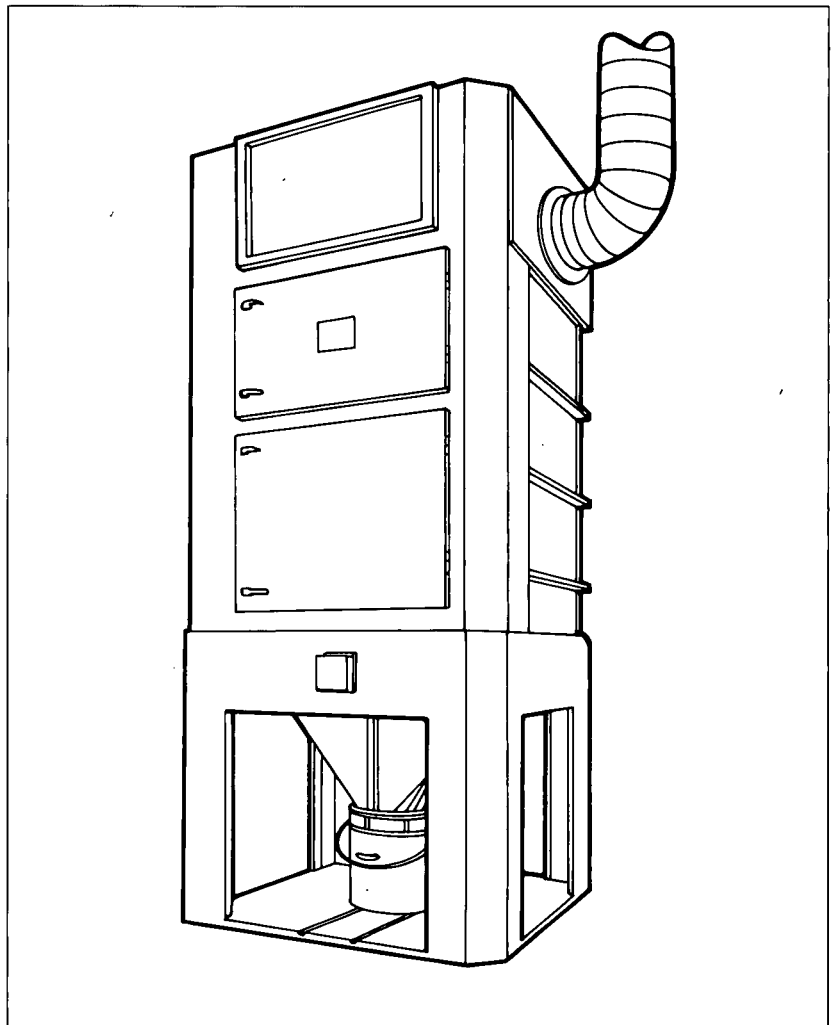
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the area, particularly when maintaining and emptying the dust extraction unit.

Design and equipment

- ✓ Where possible, locate the dust extraction unit outside of the main working area, but away from draughts and the prevailing wind.
- ✓ Consider the need for explosion relief for combustible solids and ensure that equipment is appropriately earthed.
- ✓ Determine how often the waste bin will require emptying.
- ✓ Consider how the bin will be moved for emptying and provide mechanical help if necessary.
- ✓ Dispose of waste in accordance with environmental legislation.
- ✓ You can re-circulate clean filtered air into the workroom.



Maintenance

- ✓ Ensure equipment used in the task is maintained as advised by the supplier/installer in effective and efficient working order.

Examination and testing

- ✓ Get information on the design performance of the extraction unit from the supplier. Keep this information to compare with future test results.
- ✓ Check associated ventilation equipment is in working order, at least once a week.
- ✓ Get the associated ventilation equipment examined and tested against its performance specification.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Ensure the bin is emptied on a regular basis.
- ✗ Do not allow the waste bin to overflow.
- ✓ Provide a lid to put on the waste bin when it is moved.
- ✓ Clean work equipment and the work area outside the defined storage area daily. Clean other equipment regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✗ Don't clean up with a dry brush or compressed air. Vacuum or wet mop.

Personal protective equipment (PPE)

- ✓ Materials allocated to **hazard group S** can harm the skin and eyes or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is needed.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment may be necessary for emptying the waste bin.
- ✓ Keep any PPE clean and replace at recommended intervals.

Training

- ✓ Give workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *Controlling airborne contaminants in the workplace* Technical guide no 7 British Occupational Hygiene Society 1987 ISBN 0 905927 42 7.
- *Safe handling of combustible dusts* HSG103 HSE Books 1994 ISBN 0 7176 0725 9.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Empty the bin on a regular basis - as per instructions - and before it overfills.
- Stand upwind when removing the waste bin from the extraction unit.
- Put the lid on the bin before moving it.
- Empty the waste bin carefully and keep the tipping height as low as possible to avoid creating dust clouds.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Clear up spills straight away. Use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on using local exhaust ventilation which is the commonest form of engineering control. It can be applied to a range of tasks involving small, medium and large-scale use of solids or liquids. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Local exhaust ventilation

Engineering control

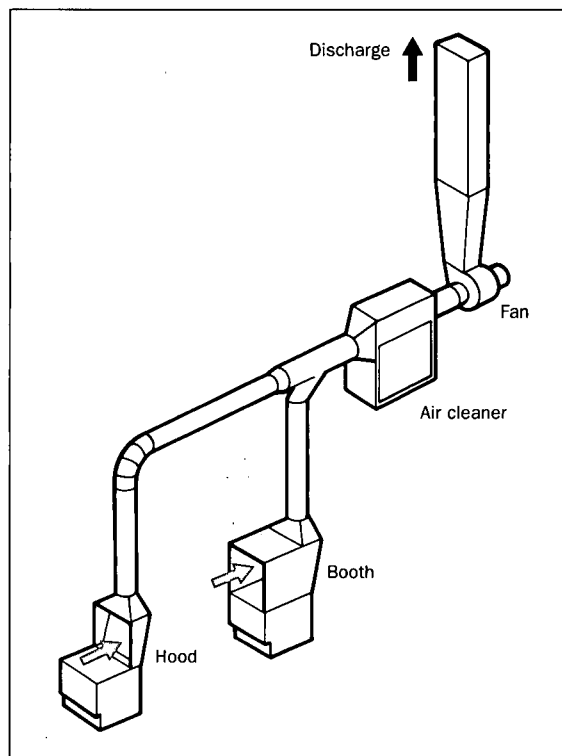
200

Access

- ✓ Restrict access to the working area to authorised staff only.

Design and equipment

- ✓ Apply local exhaust ventilation (LEV) at the source of exposure to capture the dust or vapour.
- ✓ Enclose the source of dust or vapour as much as possible to help stop it spreading.
- ✓ Don't allow the worker to get between the source of exposure and the LEV, otherwise they'll be directly in the path of the contaminated air flow.
- ✓ Where possible, site the work area away from doors, windows and walkways, to stop draughts interfering with the LEV and spreading the dust or vapour.
- ✓ Have an air supply coming into the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the LEV is working, eg manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ With exposure to dusts, you can re-circulate clean, filtered air into the workroom.
- ✗ With exposure to vapours, re-circulation is not recommended.



Maintenance

- ✓ Maintain the LEV as advised by the supplier, in effective and efficient working order.

Examination and testing

- ✓ Get information on the design performance of the LEV from the supplier. If this isn't possible, get a competent engineer to give you information on the system's optimum performance as part of a thorough examination and test of the system. Keep this information to compare with future test results.
- ✓ Check the LEV and visible ducting at least once a week for signs of damage.
- ✓ Have the LEV examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and dispose of empty containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.
- ✗ Don't clean up with a dry brush or compressed air. Vacuum or wet clean.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment shouldn't be needed for routine tasks. It may be needed for some cleaning and maintenance activities, eg dealing with spills.
- ✓ Keep any PPE clean, and replace at recommended intervals.

Training

- ✓ Give workers information on the harmful nature of the substance.
- ✓ Provide them with training on handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- *Controlling airborne contaminants in the workplace* Technical guide no 7 British Occupational Hygiene Society 1987 ISBN 0 905927 42 7.
- Control guidance sheets 101, 204, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the LEV is switched on and is working.
- Make sure it is working properly; check the manometer, pressure gauge or tell-tale.
- Make sure the air movement is across or away from your face.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that paper bags and other waste aren't drawn into the LEV.
- Wash your hands before and after eating, drinking or using the lavatory.
- Don't use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb spills with granules or mats. For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Fume cupboard

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Engineering control

Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on using a fume cupboard or a back ventilated workbench. It can be applied to many small-scale tasks using solids or liquids, eg weighing or mixing. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

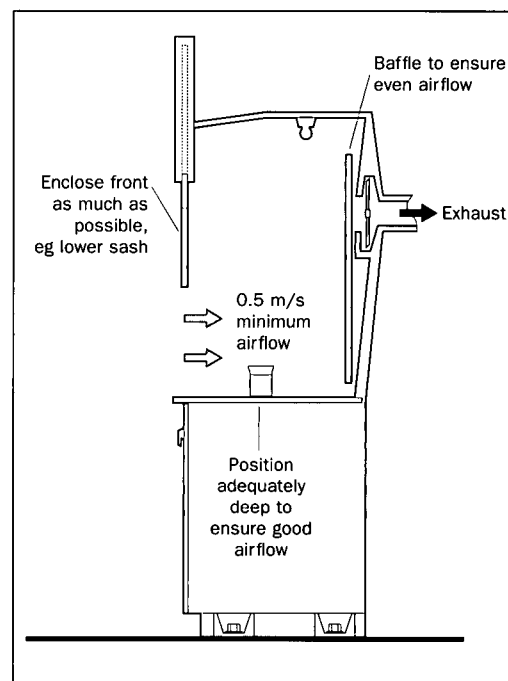
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the working area to authorised staff only.

Design and equipment

- ✓ Ensure fume cupboards are designed to recognised standards.
- ✓ Air flow at the opening of the cupboard should be at least 0.5 metre per second for vapour and 1.0 metre per second for dust.
- ✓ Make the cupboard deep enough to comfortably contain equipment and materials.
- ✓ Keep the opening as small as possible, but allow enough room to work safely. Keep the sash down as far as possible.
- ✓ Provide good lighting. It should be suitable for the chemical(s) or task(s), eg dust tight or flameproof.
- ✓ Where possible, site the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dust or vapour.
- ✓ Have an air supply coming into the workroom to replace air extracted by the fume cupboard.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the equipment is working, eg manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ With exposure to dusts you can re-circulate clean, filtered air into the workroom.
- ✗ With exposure to vapours, re-circulation is not recommended.



Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in effective and efficient working order.

Examination and testing

- ✓ Get information on the design performance of the equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the equipment at least once a week for signs of damage.
- ✓ Have the equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and dispose of empty containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.
- ✗ Don't clean up with a dry brush or compressed air. Vacuum or wet clean.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment shouldn't be needed for routine tasks. It may be needed for some cleaning and maintenance activities, eg dealing with spills.
- ✓ Keep any PPE clean and replace at recommended intervals.

Training

- ✓ Give workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation equipment is switched on and is working.
- Make sure it is working properly; check the manometer, pressure gauge or tell tale.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that paper bags and other waste aren't drawn into the ventilation system.
- Make sure large items don't obstruct the opening to the cupboard.
- Wash your hands before and after eating, drinking or using the lavatory.
- Don't use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb spills with granules or mats. For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



COSHH essentials:
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Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on using a laminar flow booth. It can be applied to many medium-scale tasks using solids or liquids, eg weighing or mixing. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Laminar flow booth

Engineering control

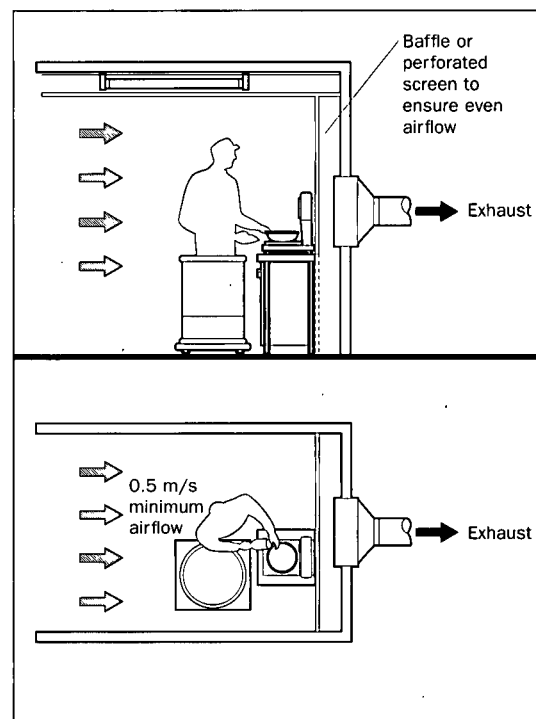
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Access

- ✓ Restrict access to the working area to authorised staff only.

Design and equipment

- ✓ The booth should be large enough to contain all equipment and materials needed for the task.
- ✓ Air should be exhausted from the booth across the full cross-sectional area - see diagram.
- ✓ Ensure airflow across the whole of the working area is smooth and at least 0.5 metre per second.
- ✓ Air inlets, which may be powered and include filters, should be opposite the exhaust ventilation so air moves across the work area.
- ✓ Work 'side-on' to the airflow to reduce exposure.
- ✓ Provide turntables in the booth, if this will make the task easier.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task(s), eg dust tight or flameproof.
- ✓ Where possible, site the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading the dust or vapour.
- ✓ Have an adequate air supply coming into the workroom to replace extracted air.
- ✓ Provide an easy way of checking the equipment is working, eg manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ With exposure to dusts you can re-circulate clean, filtered air into the workroom.
- ✗ With exposure to vapours, re-circulation is not recommended.



Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in effective and efficient working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the equipment at least once a week for signs of damage.
- ✓ Have the equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and dispose of empty containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.
- ✗ Don't clean up with a dry brush or compressed air. Vacuum or wet clean.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment shouldn't be needed for routine tasks. It may be needed for some cleaning and maintenance activities, eg dealing with spills.
- ✓ Keep any PPE clean, and replace at recommended intervals.

Training

- ✓ Give workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, 204, S100 and S101.

Employee checklist for making the best use of the controls

Make sure the ventilation equipment is switched on and is working.

Make sure it is working properly; check the manometer, pressure gauge or tell-tale.

Make sure the air movement is across or away from your body and face.

Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.

Make sure that paper bags and other waste aren't drawn into the ventilation system.

Make sure that large items don't obstruct the opening to the booth.

Wash your hands before and after eating, drinking or using the lavatory.

Don't use solvents to clean your skin.

Clear up spills straight away. For liquids, contain or absorb spills with granules or mats. For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.

Use, maintain and store any PPE provided in accordance with instructions.



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Ventilated workbench

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Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements

of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on using a ventilated workbench with underbench extraction. It can be applied to a range of tasks involving small-scale use of solids or liquids, eg cleaning or applying adhesives. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

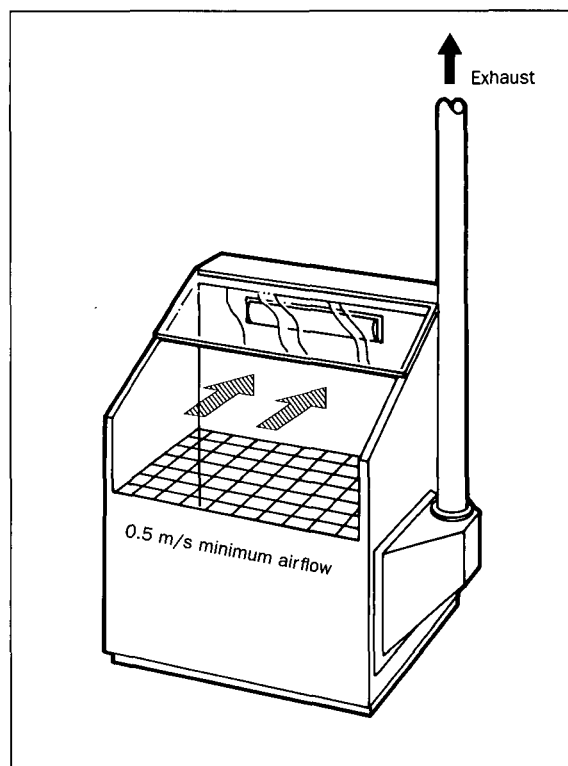
Engineering control

Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Air flow where the operator works should be at least 0.5 metre per second for extracting vapour, and 1.0 metre per second for dust.
- ✓ Enclose the workbench as much as possible - see diagram.
- ✓ Make the workbench deep enough to comfortably contain equipment and materials.
- ✓ Don't store items on the ventilation grill.
- ✓ Keep the opening as small as possible - but allow enough room to work safely.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task(s), eg dust tight or flameproof.
- ✓ Where possible, site the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading the dust or vapour.
- ✓ Have an air supply coming into the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the equipment is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ With exposure to dusts, you can re-circulate clean, filtered air into the workroom.
- ✗ With exposure to vapours, re-circulation is not recommended.



Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in effective and efficient working order.

Examination and testing

- ✓ Get information on the design performance of the equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the equipment at least once a week for signs of damage.
- ✓ Have the equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place, and dispose of empty containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.
- ✗ Don't clean up with a dry brush or compressed air. Vacuum or wet clean.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment shouldn't be needed for routine tasks. It may be needed for some cleaning and maintenance activities, eg dealing with spills.
- ✓ Keep any PPE clean and replace at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, 204, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation equipment is switched on and is working.
- Make sure it is working properly; check the manometer, pressure gauge or tell-tale.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure large items don't obstruct the opening to the workbench.
- Wash your hands before and after eating, drinking or using the lavatory.
- Don't use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb spills with granules or mats. For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control, or control approach 3 - containment (for medium-scale uses only), as the suitable approach for your chemical(s) and task(s).

This sheet provides advice on removing waste from a dust extraction or air cleaning unit. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals are also flammable or corrosive. Where they are, your controls must be suitable for those hazards, too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Removing waste from a dust extraction unit

Engineering control

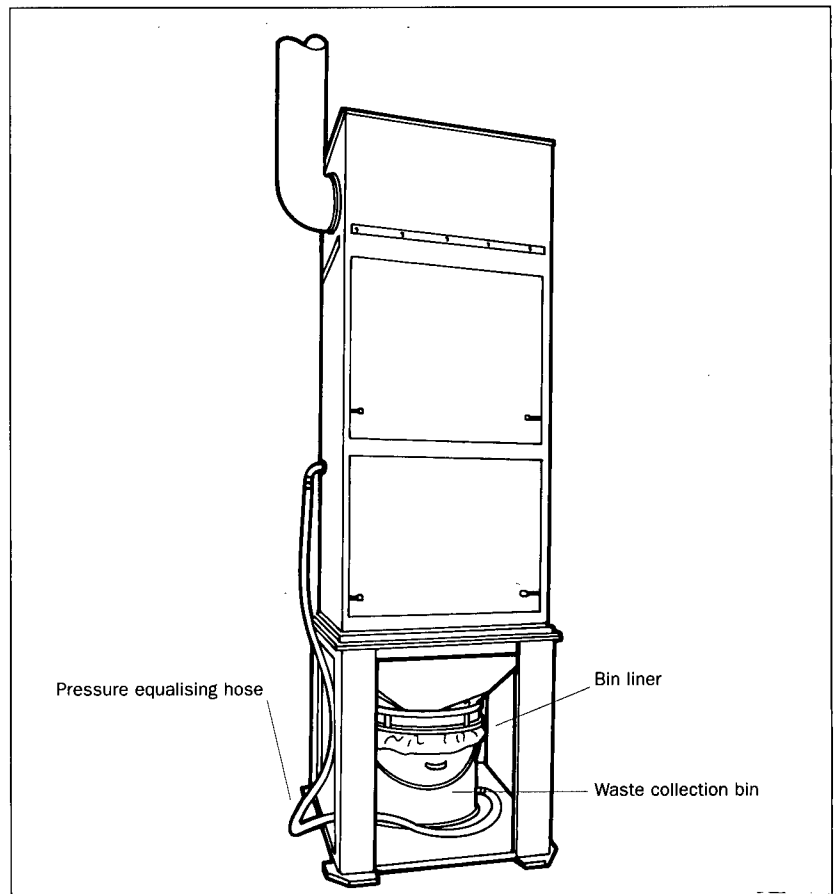
204

Access

- ✓ Restrict access to the work area to authorised staff.

Design and equipment

- ✓ Where possible, locate the extraction unit outside of the main work area, but away from draughts and the prevailing wind.
- ✓ Consider the need for explosion relief for combustible solids, and ensure that equipment is appropriately earthed.
- ✓ Have a pressure equalising mechanism at the base of the waste bin to prevent the bag being sucked out.
- ✓ Determine how often the waste bin will require emptying.
- ✓ Consider providing a shut-off valve to isolate the bin for removal.
- ✓ Consider how the bin will be lifted for emptying, and provide mechanical help if necessary.
- ✓ Dispose of waste in accordance with environmental legislation.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ You can re-circulate clean, filtered air into the workroom.



Maintenance

- ✓ Ensure the extraction unit is maintained as advised by the supplier/installer. It should be in efficient and effective working order.

Examination and testing

- ✓ Get information on the design performance of the extraction unit from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Get the ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Ensure the bin is emptied on a regular basis.
- ✓ Tie the dust bag top before removal from the bin.
- ✗ Do not allow the waste bin to overfill.
- ✓ Clean work equipment and the work area daily. Clean other equipment regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✗ Don't clean up with a dry brush or compressed air. Vacuum or wet clean.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment may be necessary for emptying the waste bin.
- ✓ Keep PPE clean and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- *Safe handling of combustible dusts* HSG103 HSE Books 1994 ISBN 0 7176 0725 9.
- Control guidance sheets 101, 302, S100 and S101.

Employee checklist for making the best use of the controls

- Empty the bin on a regular basis - as per instructions and before it overfills.
- Stand upwind when removing the waste bin from the extraction unit.
- Look for signs of damage, wear or poor operation of the extraction unit. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that the bag or other waste is not drawn into the filter unit.
- Wash your hands before and after eating, drinking or using the lavatory.
- Clear up spills straight away. Use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use maintain and store any PPE provided in accordance with instructions.



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Conveyor transfer



Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health (COSHH) Regulations 1999 by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on using a conveyor for transferring medium and large quantities of solids. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Engineering control

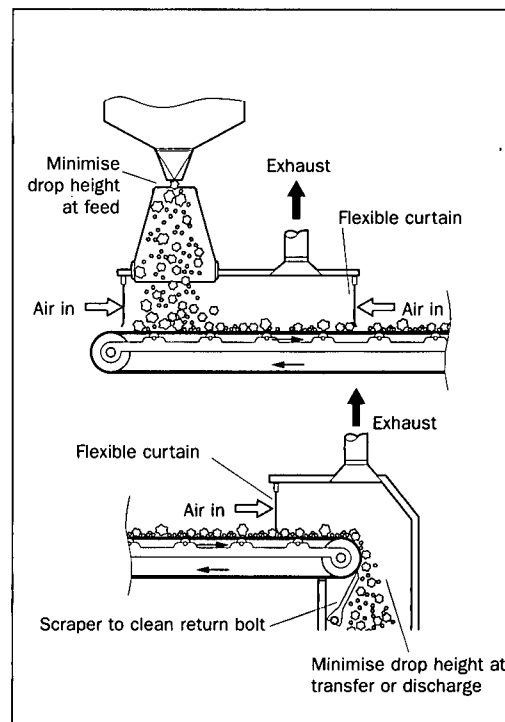
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Access

- ✓ Restrict access to the work area to authorised staff.

Design and equipment

- ✓ Consider wetting to reduce the dustiness of the material.
- ✓ Enclose the belt as much as possible, and particularly at the feed and discharge points.
- ✓ Provide dust curtains at the open ends of the enclosures and skirting at the sides of the belt.
- ✓ Provide local exhaust ventilation (LEV) at the feed chute and drop points - see diagram.
- ✓ The inward air flow at all openings on the conveyor enclosure should be at least 1 metre per second.
- ✓ Design the enclosure in sections to allow easy access for cleaning and maintenance.
- ✓ Hinged doors should be provided for routine inspection tasks.
- ✓ Provide as much space as possible within the enclosures. This will help contain the dust.
- ✓ Position the feed chute so material joins the centre of the belt, moving in the same direction and at the same speed as the belt. Minimise the height that the material falls from the chute to the belt.
- ✓ Fit a scraper to clean the return belt.
- ✓ Use a similar approach for bucket elevators and screw conveyors.
- ✓ Where possible, site the working area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dust.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the LEV is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ You can re-circulate clean, filtered air into the workroom.



Maintenance

- ✓ Maintain equipment as advised by the supplier/installer, in effective and efficient working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information for future reference.
- ✓ Visually inspect the equipment at least once a week for signs of damage.
- ✓ Ensure the ventilation equipment is examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store packages/containers in a safe place - see CGS 101.
- ✗ Don't clean up with a dry brush or compressed air. Vacuum or wet clean.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that all control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, 204, S100 and S101.

Employee checklist for making the best use of the controls

Make sure the skirting and curtains are intact, and the ventilation system is switched on and is working.

Make sure it is running properly; check the manometer, pressure gauge or tell-tale.

Look for signs of leaks and spills from the belt or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.

Wash your hands before and after eating, drinking or using the lavatory.

Do not use solvents to clean your skin.

Clear up spills straight away. Use vacuum cleaning or wet mopping. Dispose of spills safely.

Use, maintain and store any PPE provided in accordance with instructions.



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Sack filling

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Engineering control

Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on sack and bag filling, and can be applied to tasks involving medium quantities of solids. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

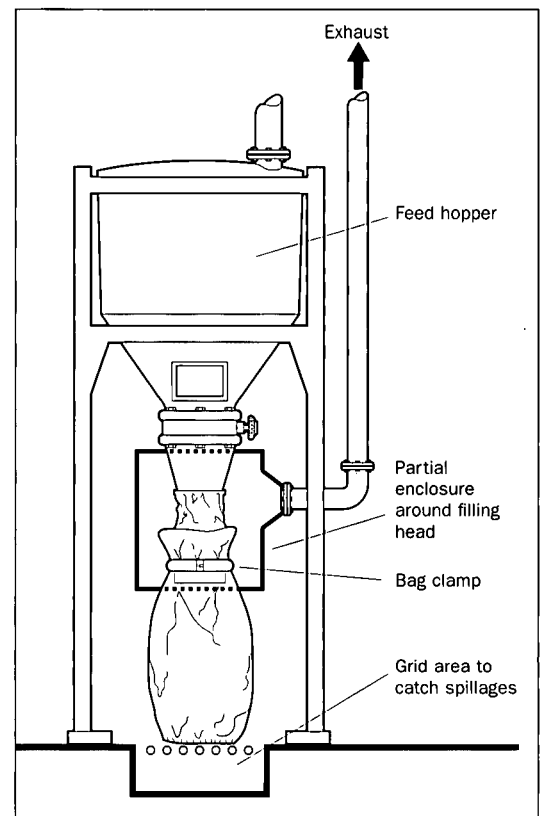
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the work area to authorised staff.

Design and equipment

- ✓ Ensure bag/sacks and filling equipment are compatible and well maintained.
- ✓ Enclose the filling head as much as possible - see diagram.
- ✓ Provide a ventilated enclosure around the filling point with an inward air flow of at least 1 metre per second.
- ✓ Make sure the enclosure is large enough to allow the bag/sack to be closed before it leaves the enclosure.
- ✓ Check for dust emission during filling. Provide clamps and seals, and make arrangements to discharge air displaced during filling.
- ✓ Provide a hopper at floor level to capture spills.
- ✓ Ensure the filling head doesn't discharge dust when the bag/sack is removed.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task(s), eg dust tight or flameproof.
- ✓ Avoid manual handling.
- ✓ Where possible, site the work area away from doors, windows and walkways, to stop draughts interfering with the ventilation and spreading dust.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ You can re-circulate clean, filtered air into the workroom.



Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in effective and efficient working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier to compare with future test results.
- ✓ Visually check the equipment at least once a week for signs of damage.
- ✓ Ensure the ventilation equipment is examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store sacks/bags in a safe place and dispose of empty sacks/bags safely - see CGS 101.
- ✗ Don't clean up with a dry brush or compressed air. Vacuum or wet clean.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, 204, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that bags and other waste aren't drawn into the ventilation duct.
- Use handling aids when provided.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. Use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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High-throughput sack filling

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Engineering control

Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on high-throughput sack and bag filling, and can be applied to tasks involving large quantities of solids. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

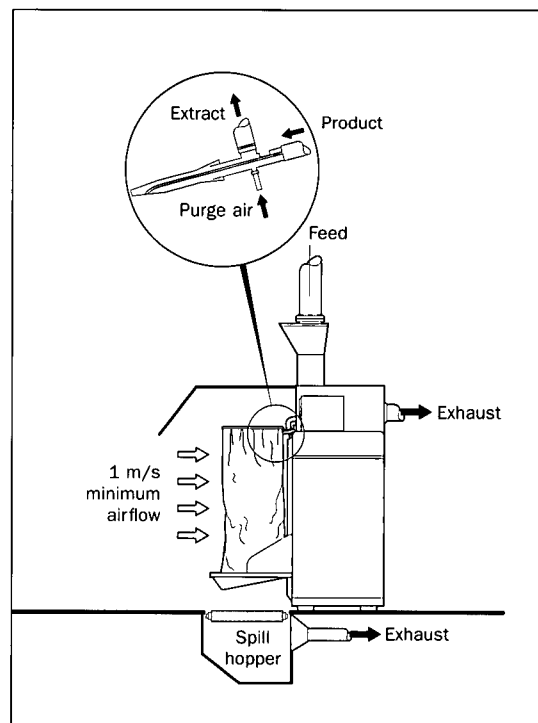
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Ensure the bag/sacks and filling equipment are compatible and well maintained.
- ✓ Provide a ventilated enclosure around the filling point with a minimum inward air flow of 1.0 metre per second.
- ✓ Make the enclosure large enough to allow the bag/sack to be closed before it leaves the enclosure.
- ✓ Special care should be taken in designing the filling nozzle to prevent dust emissions during filling, and to provide a route for air displaced from the bag during filling - see diagram.
- ✓ Provide a ventilated hopper at floor level to capture spills.
- ✓ Make sure the filling head doesn't discharge dust when the bag/sack is ejected.
- ✓ Consider mechanical/pneumatic assistance with bag/sack handling.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task(s), eg dust tight or flameproof.
- ✓ Where possible, site the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dust.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ You can re-circulate clean, filtered air into the workroom.



Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in effective and efficient working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the working area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store bags/sacks in a safe place and dispose of empty bags/sacks safely (see CGS 101).
- ✗ Don't clean up with a dry brush or compressed air. Vacuum or wet clean.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- *Safe handling of combustible dusts* HSG103 HSE Books 1994 ISBN 0 7176 0725 9.
- Control guidance sheets 101, 204, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that bags and other waste are not drawn into the ventilation duct.
- Use handling aids when available.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. Use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



COSHH essentials:
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Sack emptying

Control approach 2

Engineering control

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This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on emptying sacks and bags, and can be applied to tasks involving medium quantities of solids. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

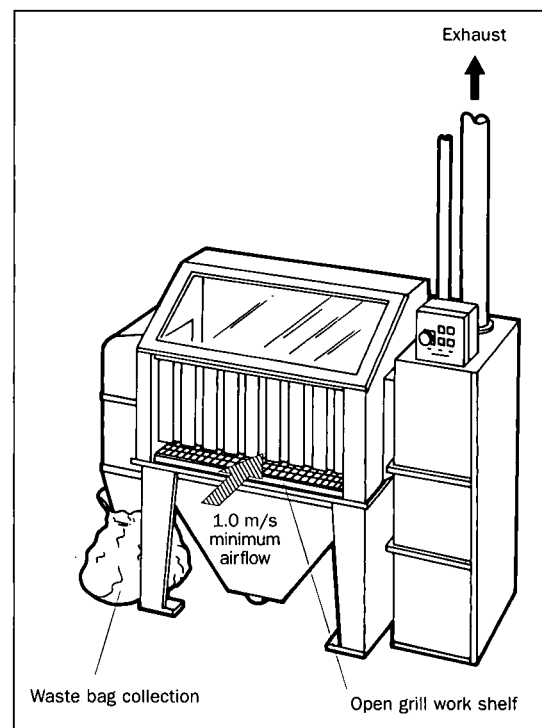
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Air flow into the enclosure should be at least 1.0 metre per second.
- ✓ Enclose the bench and bag/sack disposer as much as possible.
- ✓ Keep the open area as small as possible, but allow enough room for safe working. Use see-through panels and plastic strips to reduce the open area.
- ✓ Make the enclosure deep enough to contain bags/sacks and allow access to the waste disposal point.
- ✓ Ensure the bag disposal point can be reached easily without the operator placing their head within the enclosed area. Consider additional ventilation at the disposal point.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and tasks, eg dust tight or flameproof.
- ✓ Consider providing mechanical/pneumatic assistance with bag/sack handling.
- ✓ Where possible, site the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dust.



- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, eg manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ You can re-circulate clean, filtered air into the workroom.

Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in effective and efficient working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store bags/sacks in a safe place and dispose of empty bags/sacks safely (see CGS 101).
- ✗ Don't clean up with a dry brush or compressed air. Vacuum or wet clean.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, 204, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that bags and other waste are not drawn into the ventilation duct.
- Use handling aids when provided.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. Use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



COSHH essentials:
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Filling kegs

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Engineering control

Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on filling kegs, and can be applied to tasks involving medium quantities of solids. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

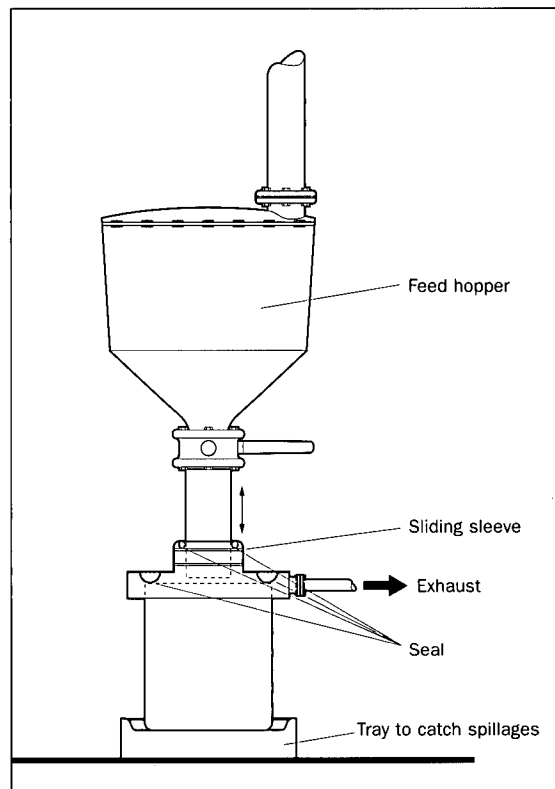
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Ensure the kegs and filling equipment are compatible and well maintained.
- ✓ Provide suitable seals between the keg and filling head.
- ✓ Provide keg liners compatible with the material(s) being handled.
- ✓ Provide a ventilated hood around the filling point with an inward air flow of at least 1 metre per second.
- ✓ Where there is manual check weighing and/or weight adjusting, this should be done within a ventilated enclosure.
- ✓ Ensure the filling head doesn't discharge dust when the keg is removed.
- ✓ Provide a tray or grid below the filling point to minimise the spread of material.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task(s), eg dust tight or flameproof.
- ✓ Consider providing handling aids to minimise manual handling.
- ✓ Clean the outside of the keg by vacuum or wet wiping.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dust.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ You can re-circulate clean, filtered air into the workroom.



Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in efficient and effective working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have the ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store kegs in a safe place and dispose of empty kegs safely (see CGS 101).
- ✗ Don't clean up with a dry brush or compressed air. Vacuum or wet clean.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, 204, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that keg liners and other waste material aren't drawn into the ventilation duct.
- Use handling aids when provided.
- Wash your hands before and after eating, drinking or using the lavatory.
- Clear up spills straight away. Use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on charging reactors and mixers from a sack or keg, and can be applied to tasks involving small and medium quantities of solids. It is also suitable for occasional (once a day) use with solids needing control approach 3. The sheet describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Charging reactors and mixers from a sack or keg

Engineering control

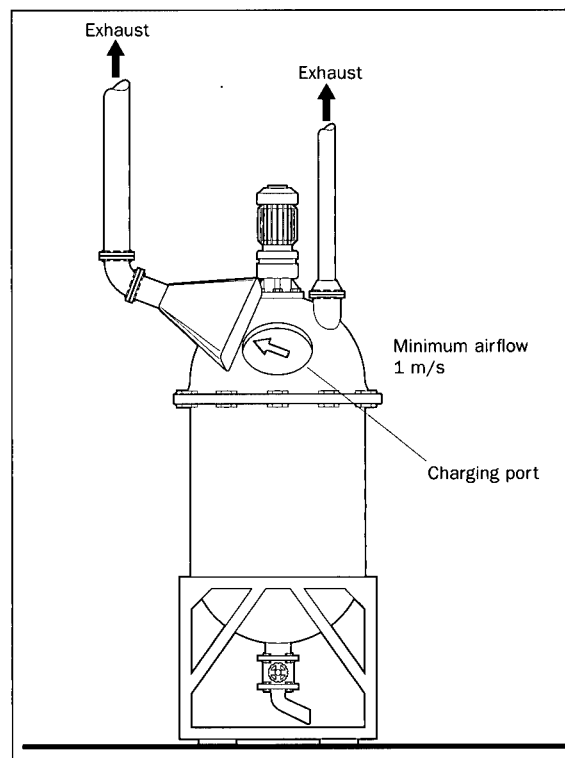
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Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Provide suitable handling aids to minimise manual handling.
- ✓ Any lifting and tipping equipment should be correctly designed for the task, and be suitable for the size of sack or keg being lifted.
- ✓ The tipping mechanism should operate smoothly to allow controlled emptying.
- ✓ Provide a ventilated enclosure around the discharge point with a minimum inward air flow of at least 1.0 metre per second across all of the opening.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task, eg dust tight or flameproof.
- ✓ Where possible, locate the working area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dust.



- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✗ Do not re-circulate air into the workroom unless it has been adequately cleaned.

Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in effective and efficient working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have the ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store sacks or kegs in a safe place and when empty, dispose of them safely (see CGS 101).
- ✗ Don't clean up with a dry brush or compressed air.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, 204, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that paper bags and other waste material are not drawn into the ventilation duct.
- Use handling aids - avoid manual handling.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. Use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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IBC filling and emptying

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Engineering control

Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of

the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on filling and emptying an IBC (International bulk carrier) with large quantities of solids. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

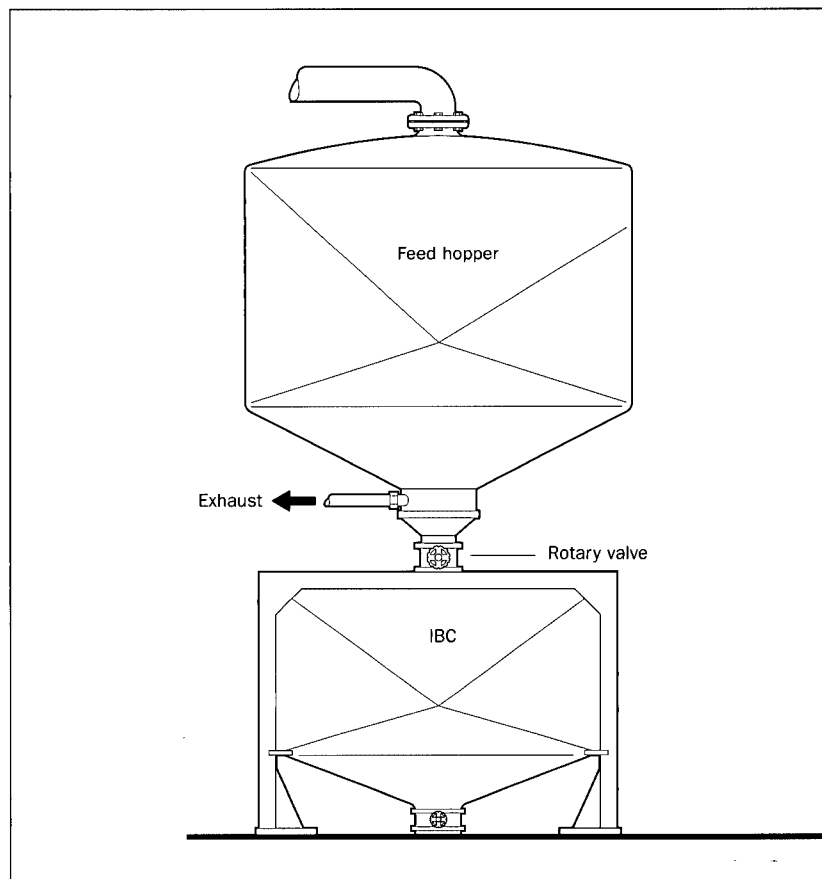
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Ensure the IBC is designed and constructed for the material it will contain.
- ✓ Take precautions to prevent over-filling, eg load cells.
- ✓ Ensure air displaced during filling is vented to a safe place, eg back into the supply tank.
- ✓ Provide seals on access hatches.
- ✓ Provide a means to isolate or control the filling/emptying rate, eg a rotary valve.
- ✓ Ensure the connections do not leak.
- ✓ Provide good access for fork-lift trucks.
- ✓ Provide barriers and notices.
- ✓ Consider the need for explosion relief for combustible solids, and ensure equipment is appropriately earthed.
- ✓ Keep extraction ducts short and simple, and avoid long sections of flexible duct.



Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in effective and efficient working order.

Examination and testing

- ✓ Get information on the design performance of the equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the equipment at least once a week for signs of damage.
- ✓ Have any ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store materials in a safe place (see CGS 101).
- ✗ Don't clean up with dry brushing or compressed air. Vacuum or wet clean.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Safe handling of combustible dusts* HSG103 HSE Books 1994 ISBN 0 7176 0725 9.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and is working.
- Take special care not to overfill the IBC.
- Ensure barriers and warning notices are in position.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. Use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Drum filling

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Engineering control

Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of

the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on filling drums, and can be applied to tasks involving medium quantities of liquids. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

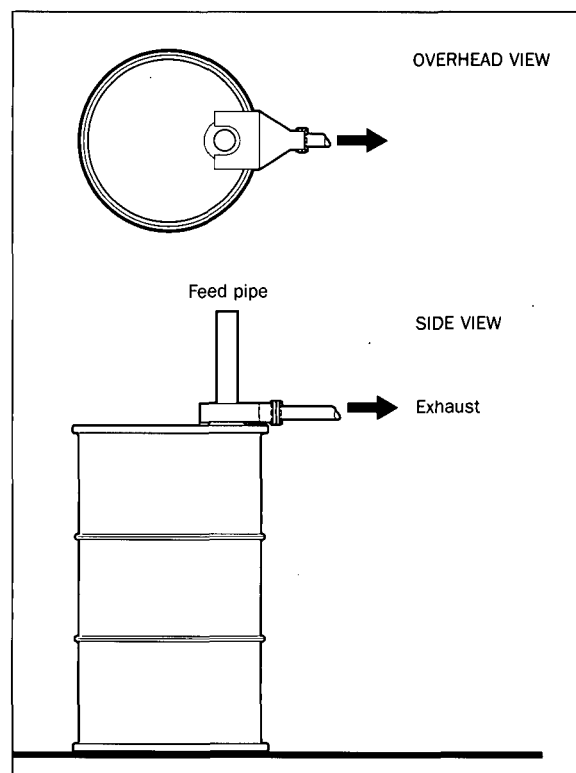
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Carry out drum filling only in a designated area with spillage containment.
- ✓ Position the local exhaust ventilation (LEV) slot as near to the top of the drum as possible.
- ✓ Air flow across the drum cap towards the LEV should be at least 0.5 metre per second.
- ✓ The length of the fill pipe should enable it to be submerged during filling.
- ✓ Prevent splashing by using funnels, guards, etc.
- ✓ Ensure drums can be easily positioned close to the LEV slot. Guides should be used for positioning drums and adjustable for different size drums.
- ✓ Use a load cell or metered flow to prevent overfilling.
- ✓ For flammable liquids, use suitable pumps/fans and appropriately earthed equipment.
- ✓ Where possible, site the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading contamination.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Consider providing handling aids to minimise manual handling.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✗ With vapours, re-circulation is not recommended.



Maintenance

- ✓ Maintain all equipment used in the task as advised by the supplier/installer, in effective and efficient working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store drums in a safe place and dispose of empty drums safely (see CGS 101).

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that bags and other waste aren't drawn into the ventilation duct.
- Prevent splashing by using funnels and guards, and by ensuring that fill pipes are submerged in the drum.
- Wash your hands before and after eating, drinking or using the lavatory.
- Use handling aids when provided.
- Do not use solvents to clean your skin.
- Clear up spills straight away. Contain or absorb spills with granules or mats. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Drum emptying using a drum pump

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Engineering control

Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on using a drum pump to empty drums, and can be applied to tasks involving medium quantities of liquids. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

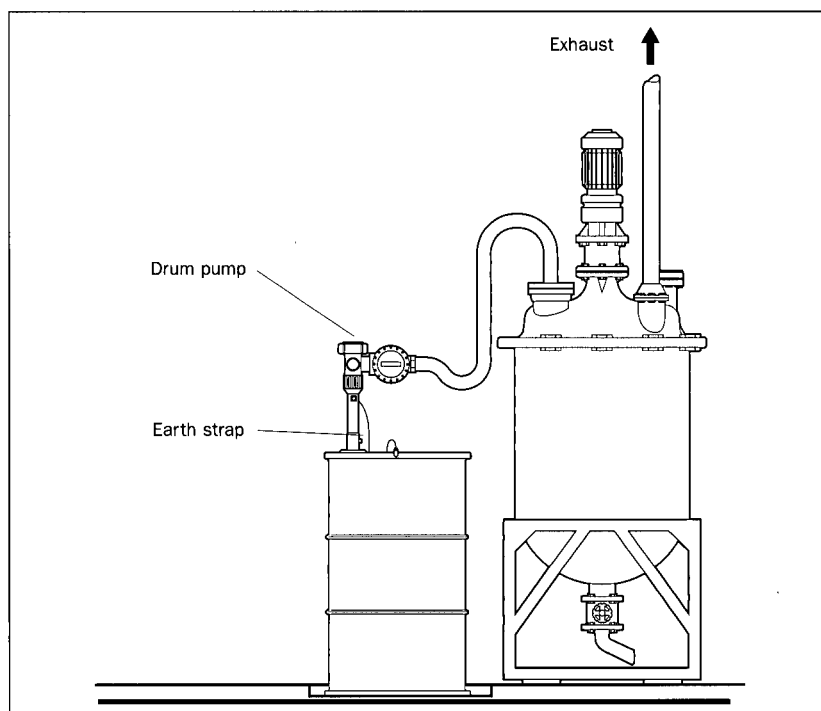
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Ensure the area is well ventilated.
- ✓ Design the work area for ease of maintenance and, when possible, use equipment designed for easy maintenance.
- ✗ Take care not to touch the dip pipe after removal from the drum.
- ✓ Provide containment around the drum to catch drips and leaks.
- ✓ Ensure the pump is suitable for the liquid to be transferred.
- ✓ Provide transfer/storage arrangements for the pump and dip pipe to minimise contact with the liquid and to stop contamination.
- ✓ Consider how the drum will be moved to the transfer area. Avoid manual handling.
- ✓ Provide a suitable 'key' for removing and replacing the drum stopper.
- ✓ For flammable liquids, use suitable pumps/fans and appropriately earthed equipment to prevent sparking from build-up of static electricity.
- ✓ Where possible, locate the work area away from doors, windows and walkways.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✗ With vapours, re-circulation is not recommended.



Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in effective and efficient working order.

Examination and testing

- ✓ Get information on the design performance of the equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check equipment at least once a week for signs of damage.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment, and the work and storage area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately - contain or absorb with granules or mats.
- ✓ Store drums in a safe place and dispose of empty drums safely (see CGS 101).

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any ventilation system is switched on and is working.
- Always remove and replace the drum stopper using a 'key'.
- Always use the earth strap.
- Use handling aids when provided.
- Take care when removing the pump from the drum to minimise vapours and skin contact. Return the pump to its storage position.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Wash hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. Contain or absorb liquids with granules or mats. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on weighing medium quantities of solids. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Weighing solids

Engineering control

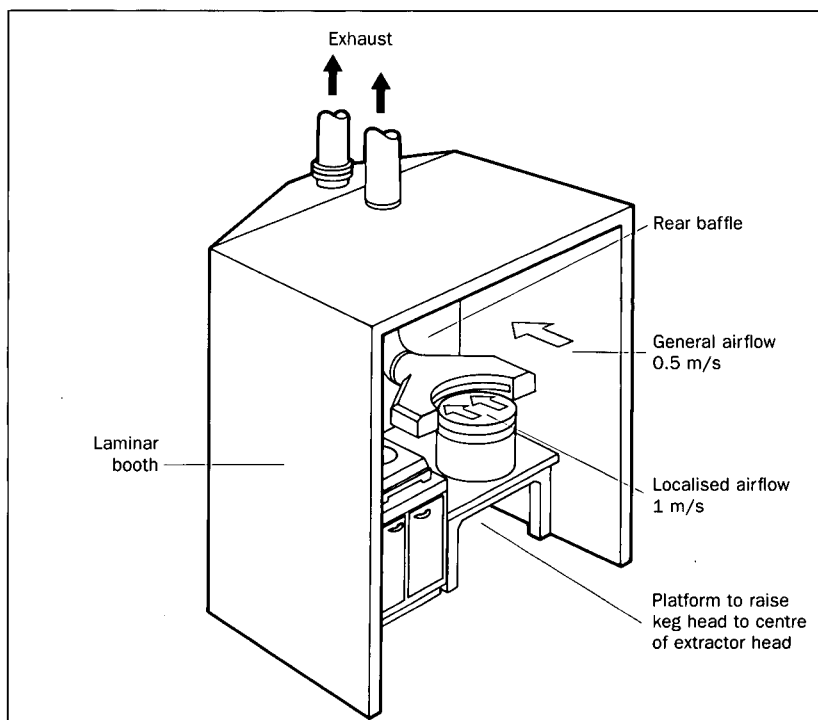
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Access

- ✓ Restrict access to the working area to authorised staff only.

Design and equipment

- ✓ The general air flow into the enclosure should be at least 0.5 metre per second. The airflow towards the hood slots should be at least 1.0 metre per second.
- ✓ Enclose the weigh station as much as possible - see diagram.
- ✓ Make the enclosure deep enough to contain equipment and materials.
- ✓ Keep the open area as small as possible - while allowing enough room for safe working. Use see-through panels and plastic strips to reduce the open area.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task(s), eg dust tight or flameproof.
- ✗ Avoid using deep kegs or kegs over 25 kg.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dust.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ You can re-circulate clean filtered air into the workroom.



Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in efficient and effective working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and dispose of empty containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.
- ✗ Don't clean up with a dry brush or compressed air. Vacuum or wet clean.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, 204, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that paper bags and other waste material aren't drawn into the ventilation duct.
- Make sure that large items do not obstruct the working opening.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. Use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on mixing medium quantities of solids with other solids or liquids. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Mixing solids with other solids or liquids

Engineering control

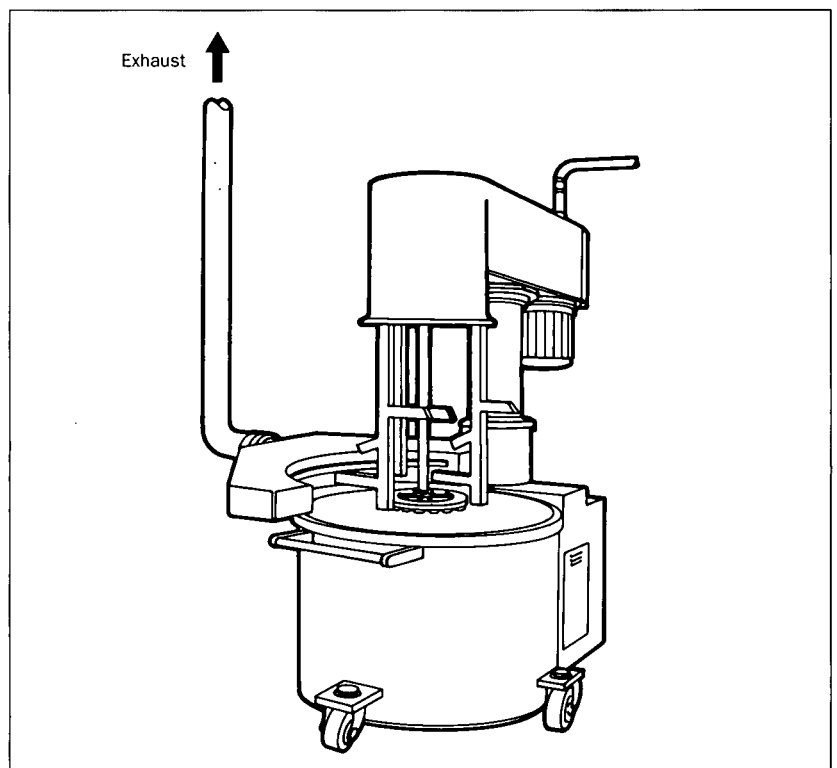
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Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Enclose the mixer as much as possible, and provide seals on the lid and other access points.
- ✓ Position the local exhaust ventilation (LEV) hood as close to the source of the dust as possible.
- ✓ Air flow across the whole mixer top towards the LEV should be at least 1.0 metre per second. It may be necessary to increase the airflow when adding materials.
- ✓ Where possible, use lids on the mixer to contain dust and vapours.
- ✓ Where possible, locate the working area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dusts.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.



Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in effective and efficient working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have the ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and dispose of empty containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.
- ✗ Don't clean up with a dry brush or compressed air. Vacuum or wet clean.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, 204, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Make sure the air movement is across or away from your face, and try not to lean into the mixer when adding materials.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that paper bags and other waste material are not drawn into the ventilation duct.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. Use vacuum cleaning or wet mopping for solids. Contain or absorb spills with granules or mats. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on mixing large quantities of solids using the example of a ribbon mixer. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Mixing solids

Engineering control

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Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Enclose the mixer as much as possible.
- ✓ Provide suitable seals on the lid and other access points to minimise dust leakage.
- ✓ Ensure that lids and other access points can be securely closed before operation of the mixer.
- ✓ Ensure the mixer, seals, gaskets, etc, are suitable for the intended use.
- ✓ Provide a ventilated enclosure around the filling point with an inward air flow of at least

1 metre per second (unless a closed feed is used).

- ✓ Consider arrangements for dust-free discharge from the mixer, eg discharge direct to an enclosed conveyor system.

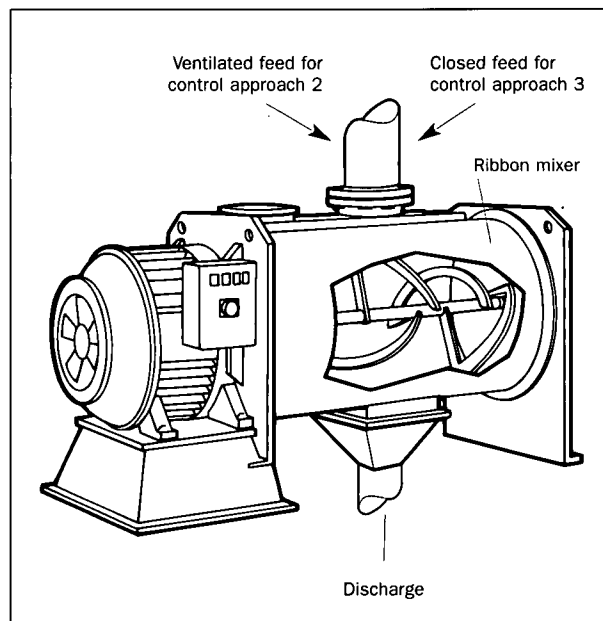
Alternatively, provide local exhaust

ventilation at the discharge point with an air flow of at least 1 metre per second.

- ✓ Where possible, locate the working area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dust.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ You can re-circulate clean, filtered air into the workroom.

Maintenance

- ✓ Maintain equipment used in the task as advised by the supplier/installer, in efficient and effective working order.



Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have the ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and dispose of empty containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.
- ✗ Don't clean up with a dry brush or compressed air. Vacuum or wet clean.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, 204, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that paper bags and other waste material aren't drawn into the ventilation duct.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. Use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Mixing liquids with other liquids or solids

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Engineering control

Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of

the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on mixing medium and large quantities of liquids with other liquids or solids. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

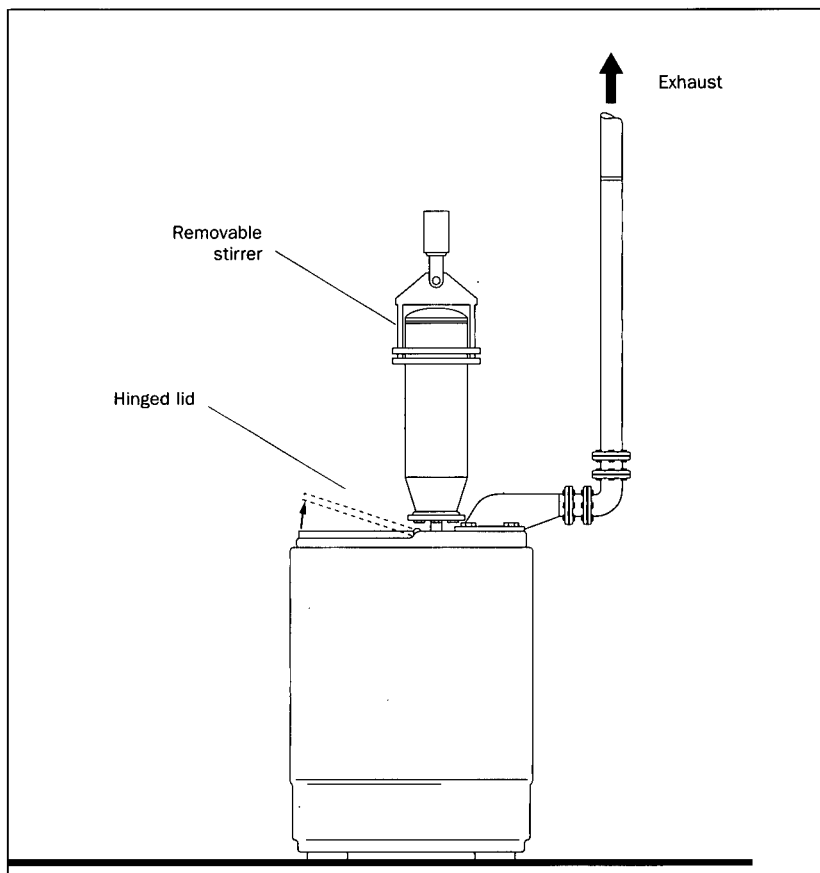
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Position the local exhaust ventilation (LEV) hood as near to the source of the vapour as possible.
- ✓ Enclose the top of the mixer as much as possible.
- ✓ Air flow across the whole mixer top towards the LEV should be at least 0.5 metre per second. If solids are mixed, it may be necessary to increase the airflow to 1.0 metre per second.
- ✓ Where possible, site the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading vapours.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✗ With vapours, air re-circulation is not recommended.



Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer in effective and efficient working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check ventilation equipment at least once a week for signs of damage.
- ✓ Ensure the ventilation equipment is examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54). Keep records of all examinations and tests for at least five years.
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and dispose of empty containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Make sure the air movement is across or away from your face.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that paper bags and other waste material aren't drawn into the ventilation duct.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. Contain or absorb liquids with granules or mats. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Control approach 2

Sieving

Engineering control

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This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on sieving medium quantities of solids. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

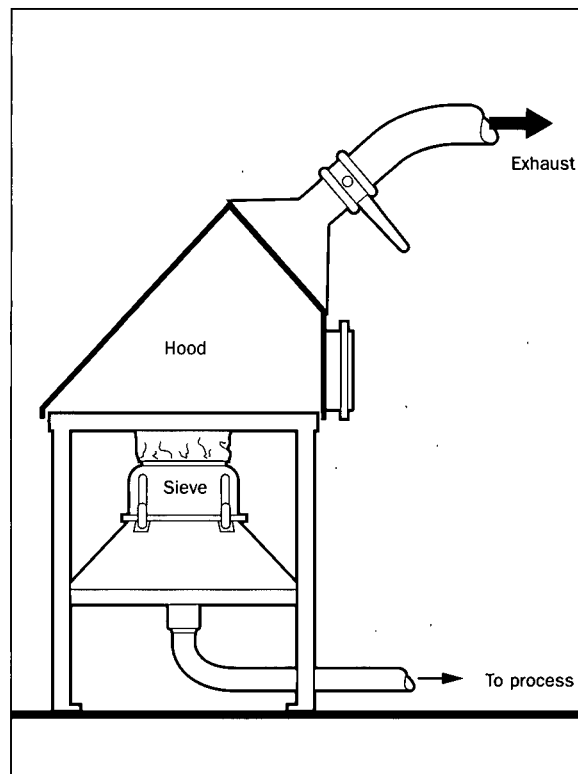
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Provide an enclosure around the filling point for the sieve - see diagram.
- ✓ Ensure an inward air flow of 1 metre per second across the face of the filling enclosure.
- ✓ Ensure that seals and/or clamps are provided to stop dust leaking between the sieve and other components.
- ✓ Provide facilities to safely dispose of empty bags. Consider the need for additional ventilation at the disposal point.
- ✓ Control the speed of sieving to the slowest speed consistent with efficient production.
- ✓ Discharge into an enclosed system, eg vacuum transfer, or provide additional local exhaust ventilation to control dust at the point of discharge.
- ✓ Consider the need for explosion relief for combustible solids, and ensure equipment is appropriately earthed.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dust.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ You can re-circulate clean filtered air into the workroom.



Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in effective and efficient working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and dispose of empty containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.
- ✗ Don't clean up with a dry brush or compressed air. Vacuum or wet clean.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, 204, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that paper bags and other waste are not drawn into the ventilation duct.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. Use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



COSHH essentials:
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Control approach 2

Screening

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Engineering control



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on screening large quantities of solids. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

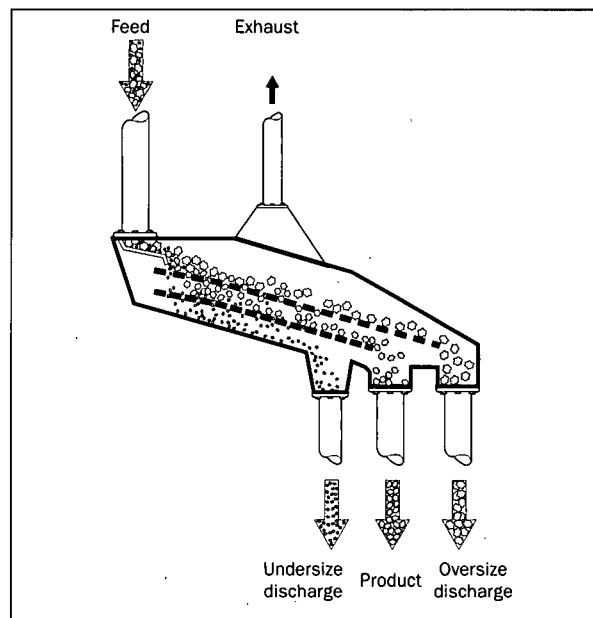
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Enclose the screen as much as possible, particularly at the feed and discharge points.
- ✓ Provide local exhaust ventilation (LEV) at the feed chute and drop points - see diagram. Additional ventilation may be required for the receiving hopper.
- ✓ The inward air flow at all openings in the screen enclosure should be at least 1 metre per second.
- ✓ Design the enclosure in sections to allow easy access for cleaning and maintenance.
- ✓ Hinged doors should be provided for routine inspection.
- ✓ Provide as much space as possible within the enclosures. This will help contain the dust.
- ✓ Consider the use of dust seals between fixed and moving parts of the screen.
- ✓ Consider the need for explosion relief for combustible solids and ensure equipment is appropriately earthed.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading contamination.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ You can re-circulate clean filtered air into the workroom.



Maintenance

- ✓ Maintain equipment as advised by the supplier/installer, in effective and efficient working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have the ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and dispose of empty containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.
- ✗ Don't clean up with a dry brush or compressed air. Vacuum or wet clean.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- *Safe handling of combustible dusts* HSG103 HSE Books 1994 ISBN 0 7176 0725 9.
- Control guidance sheets 101, 204, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Look for signs of leakage, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. Use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Control approach 2

Spray painting (small scale)

Engineering control

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This guidance sheet is aimed at employers to help them comply with the requirements of

the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice for small-scale spray painting tasks. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

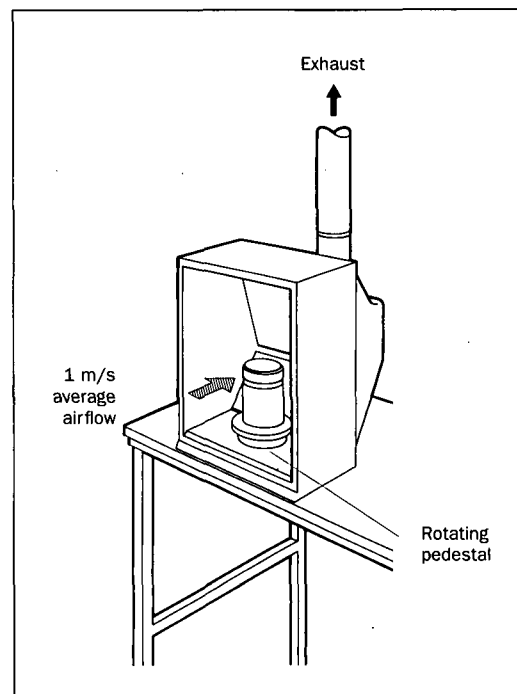
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Make the enclosure deep enough to contain equipment and materials.
- ✓ The air flow at the face of the enclosure should be at least 1.0 metre per second.
- ✓ Enclose the work area fully - see diagram.
- ✓ Keep the open area as small as possible - while allowing enough room for safe working.
- ✓ Provide a turntable to make it easier to cover all surfaces.
- ✗ Do not store items inside the ventilated area, they will obstruct the airflow.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task(s), eg dust tight or flameproof.
- ✓ Use filters to avoid paint deposits on electric motors, fan blades and ventilation ducts.
- ✓ Ensure large items do not obstruct the work opening.
- ✓ Consider where sprayed items are to be located whilst drying. A second ventilated area may be required.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading vapour.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✗ With vapours, air re-circulation is not recommended.



Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in effective and efficient working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have the ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and dispose of empty containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that paper bags and other waste material are not drawn into the ventilation duct.
- Make sure that large items do not obstruct the work opening.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb with granules or mats. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with the instructions.



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Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of

the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on medium-scale spray painting tasks. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Spray painting (medium scale)

Engineering control

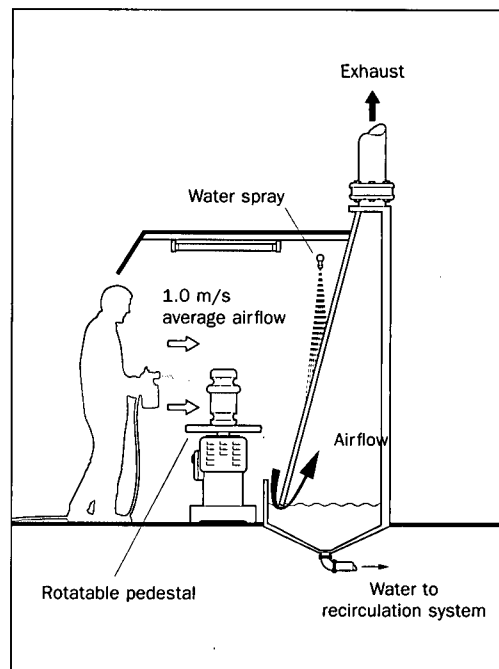
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Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ The booth should be large enough to contain all plant and equipment required for the process.
- ✓ Air should be exhausted from the booth across the full cross-sectional area.
- ✓ The air flow at the operator position should be at least 1.0 metre per second.
- ✓ Provide a turntable so that objects can be rotated and the operator does not need to spray into the airflow.
- ✓ Ensure that the water level in the reservoir is kept just above the base of the baffle (see diagram).
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task, eg vapour tight or flameproof.
- ✓ Ensure large items do not obstruct the extraction or air inlet system.
- ✓ Consider where sprayed items are to be located while drying. A second ventilated area may be required.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✗ With vapours, re-circulation is not recommended.



Maintenance

- ✓ Maintain all equipment as advised by the supplier/installer, in effective and efficient order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have the ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and dispose of containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Make sure the air movement is across or away from your face. Do not spray into the airflow.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Check that the water in the reservoir is at the correct level.
- Make sure that paper bags and other waste material are not drawn into the ventilation duct.
- Make sure large items do not obstruct the work opening.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb (with granules or mats). Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Powder coating

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Engineering control

Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on medium and large-scale powder coating tasks. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

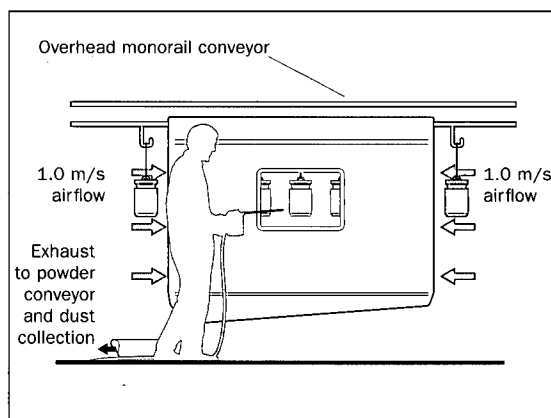
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ The booth should have smooth and impervious internal surfaces with arrangements to contain and recycle overspray powder.
- ✓ Air flow into all openings of the spray booth should be at least 1.0 metre per second.
- ✓ Consider the use of 'air curtains' at the entrance and exit to contain dust.
- ✓ Use 'direct from box' powder feed systems where possible.
- ✓ Adjust the application equipment to minimise powder use.
- ✓ Ensure work pieces are properly earthed to maximise powder attraction and minimise overspray.
- ✓ Make the booth large enough to contain overspray.
- ✓ Keep the open areas as small as possible - while allowing enough room for safe working.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task(s), eg dust tight or flameproof.
- ✓ Consider the need for explosion relief for combustible solids, and ensure that all equipment is appropriately earthed.
- ✓ Ensure workers are properly trained, and avoid bad working practices such as leaning into the booth when spraying.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dust.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ With dusts you can re-circulate clean, filtered air into the workroom.



Maintenance

- ✓ Maintain all equipment as advised by the supplier/installer, in effective and efficient order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have the ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and dispose of empty packages safely (see CGS 101).
- ✗ Minimise the use of compressed air for cleaning, and seek methods that avoid entering the booth.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- *Code of safe practice: application of thermosetting powder coatings by electrostatic spraying* British Coatings Federation 1996.
- *Control of exposure to triglycidyl isocyanurate (TGIC) in coating powders* EIS15 HSE Books 1998.
- *Code of practice: application of powder coatings by electrostatic spraying* Paint Makers Association of Great Britain 1991.
- Control guidance sheets 101, 204, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Minimise the use of compressed air during booth cleaning.
- Do not lean into the booth during spraying or cleaning.
- Wash your hands before and after eating, drinking or using the lavatory.
- Clear up spills straight away. For dusts, use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Batch lamination

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Engineering control

Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on medium and large-scale GRP (glass reinforced plastic) batch lamination tasks. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

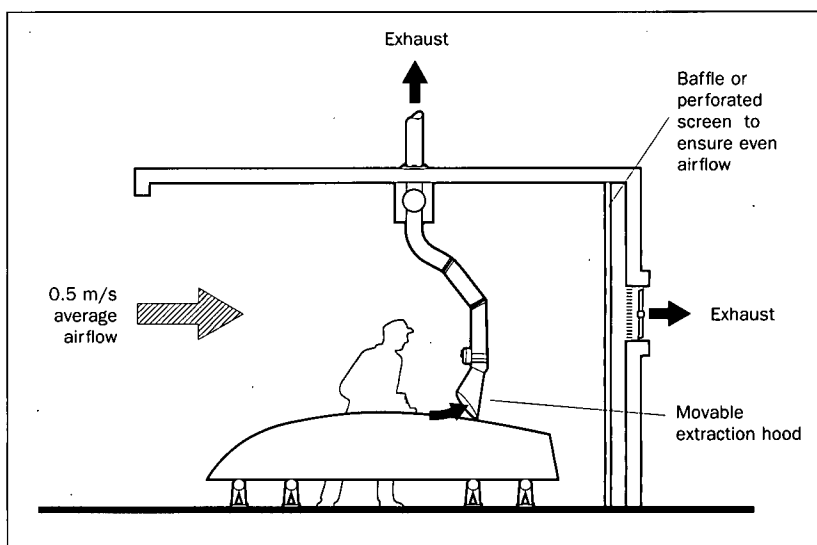
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Ensure the air enters the work area across the full cross-sectional area of the room. A positive pressure plenum with diffusers should be considered.
- ✓ The inlet air flow should be low to avoid turbulence.
- ✓ Position the lay-up area so that air flows across the mould and generally across the body of the operator.
- ✓ Provide movable local exhaust ventilation (LEV) hoods as near to the source of vapour as possible.
- ✓ Ensure there are sufficient LEV hoods to cover the working areas.
- ✓ The airflow at the operator position should be at least 0.5 metre per second.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task(s), eg dust tight or flameproof.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading vapours.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✗ With vapours, re-circulation is not recommended.



Maintenance

- ✓ Maintain all equipment as advised by the supplier/installer, in effective and efficient order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have the ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and dispose of empty containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Make sure the air movement is across or away from your face.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb with granules or mats. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on medium and large-scale continuous lamination tasks. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Continuous lamination

Engineering control

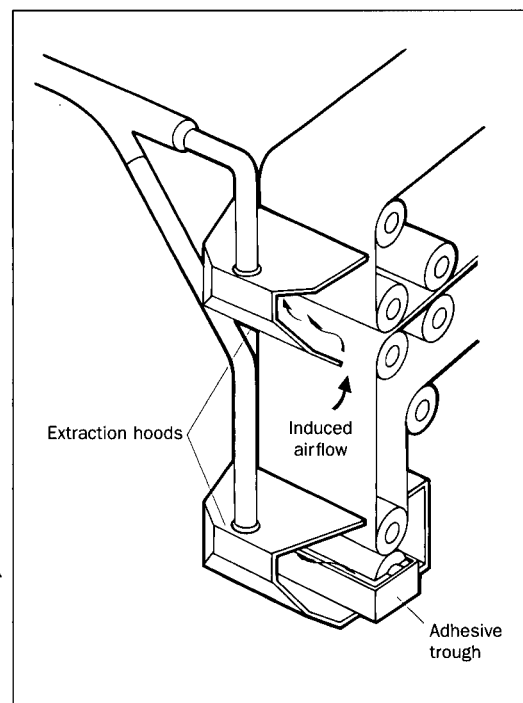
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Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Position the receiving hood as close to the source of vapour as possible - see diagram.
- ✓ Position the hood to make maximum use of the air flow induced by the movement of the material.
- ✓ The hood should extend to the full width of the material.
- ✓ The exhaust rate from the hood should exceed the air volume flowing into the hood.
- ✓ Provide good lighting. It should be suitable for the nature of the chemical(s) and task(s), eg dust tight or flameproof, if needed.
- ✓ Additional ventilation may be required at the adhesive trough.
- ✓ Where possible, site the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading contamination.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✗ With vapours, air re-circulation is not recommended.



Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in efficient and effective working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and safely dispose of empty containers (see CGS 101).
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that paper bags and other waste material are not drawn into the ventilation duct.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb with granules or mats. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



COSHH essentials:
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Pickling bath (medium scale)

225

Engineering control

Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on pickling using a medium-scale pickling bath. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

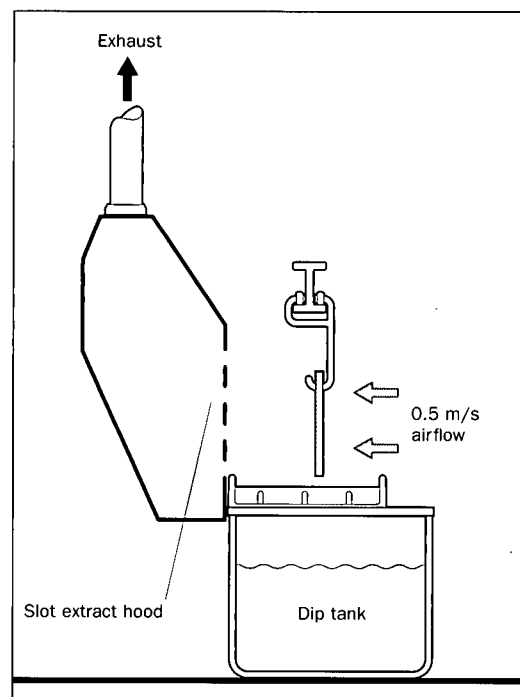
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Air flow across the surface of the tank should be at least 0.5 metre per second.
- ✓ Avoid the use of air agitation for the tank.
- ✓ Ensure replacement air is supplied evenly across the tank.
- ✓ Consider a partial cover for the tank.
- ✓ Consider the need for corrosion resistant ductwork and hoods.
- ✓ Ensure incompatible exhaust gases are segregated such as acidic vapours, alkali mists, etc.
- ✓ Consider using plastic balls/beads, anti-foams or chips, etc. to reduce vapour and mist formation on the surface of the tank.
- ✓ For an electroplating bath, select plating solutions that reduce electrode gassing.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading vapours.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✗ With vapours, air recirculation is not recommended.



Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in efficient and effective working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and dispose of empty containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- *Workplace welfare in the electroplating industry* EIS4 HSE Books 1998.
- *Immersion and cold cleaning of engineering components* EIS21 HSE Books 1998.
- *Industrial ventilation: a manual of recommended practice* American Conference of Governmental Industrial Hygienists 1998 ISBN 1 88 241722 4.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that paper bags and other waste material are not drawn into the ventilation duct.
- Make sure that the tanks are covered when not in use.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb with granules or mats. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



COSHH essentials:
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Pickling bath (large scale)

Control approach 2

Engineering control

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This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on pickling using a large-scale pickling bath. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

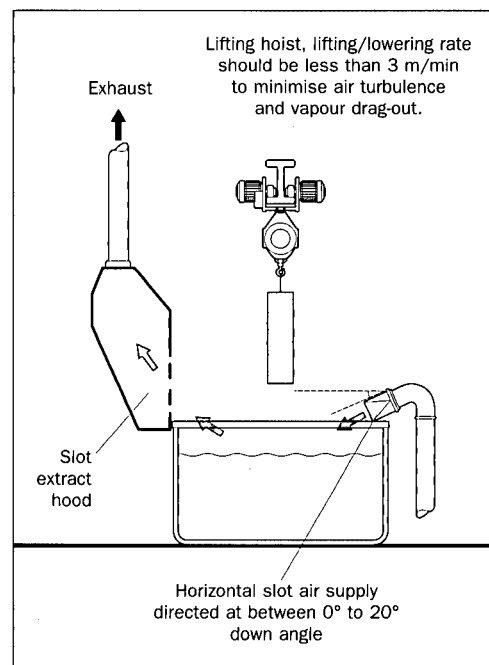
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Ensure a jet air flow across the surface of the tank directs the vapour, mist, etc, away from the operator.
- ✓ Air flow at the extraction hood slots should be at least 10 metres per second. This air flow must be greater than that of the supplied air flow.
- ✓ Avoid the use of air agitation for the tank.
- ✓ Consider the need for corrosion resistant ductwork and hoods.
- ✓ Ensure incompatible exhaust gases are segregated such as acidic vapours, alkali mists, oil vapour, etc.
- ✓ Consider using plastic balls/beads, anti-foams or chips, etc, to reduce vapour and mist formation on the surface of the tank.
- ✓ For an electroplating bath, select plating solutions that reduce electrode gassing.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading vapours.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✗ With vapours, air re-circulation is not recommended.



Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in efficient and effective working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and dispose of empty containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- *Industrial ventilation: a manual of recommended practice* American Conference of Governmental Industrial Hygienists 1998 ISBN 1 88 241722 4.
- *Workplace welfare in the electroplating industry* EIS4 HSE Books 1998.
- *Immersion and cold cleaning of engineering components* EIS21 HSE Books 1998.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure the tanks are covered when not in use.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb with granules or mats. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



COSHH essentials:
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Vapour degreasing bath

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Engineering control

Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on using medium and large-scale vapour degreasing baths. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

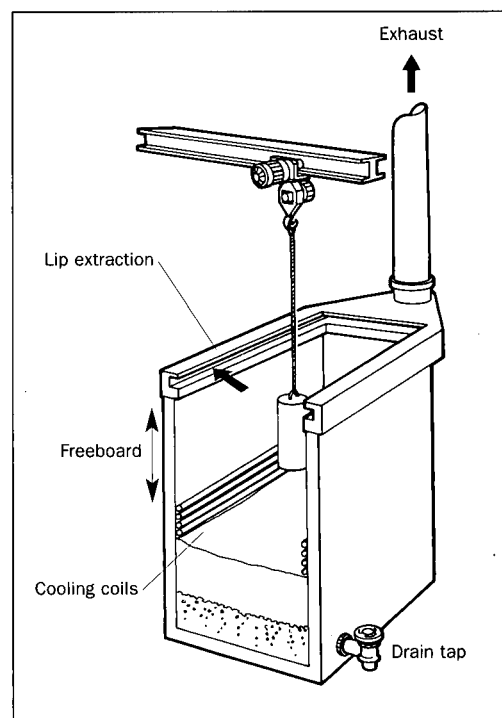
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Ensure the bath has rim ventilation.
- ✓ The freeboard height (see diagram) should be at least 75% of the width of the open area of the bath.
- ✓ Allow components to fully dry in the freeboard zone.
- ✓ Cover the bath when not in use.
- ✓ Ensure operators are trained not to withdraw workpieces too quickly from the bath as this will drag out vapour.
- ✓ Ensure the bath has a bottom drain for removing the solvent.
- ✓ Set the bath thermostat correctly and balance the heating and cooling systems so as not to overload the cooling coils.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading vapour.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✗ With vapours, re-circulation is not recommended.



Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in efficient and effective working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and dispose of empty containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- *Health and safety at degreasing operations: sources of guidance* EIS22 HSE Books 1998.
- *Maintenance and cleaning of solvent degreasing tanks* EIS20 HSE Books 1998.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation and cooling system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale for the ventilation and the bath thermostat.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Do not withdraw workpieces too quickly from the bath.
- Make sure the baths are covered when not in use.
- Do not enter a bath to clean it without taking suitable precautions. These are explained in the HSE information sheet EIS20. People have died doing this job incorrectly.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb with granules or mats. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



COSHH essentials:
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Tray drying oven

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Engineering control

Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on medium-scale drying tasks using a tray drying oven. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the work area to authorised staff only.

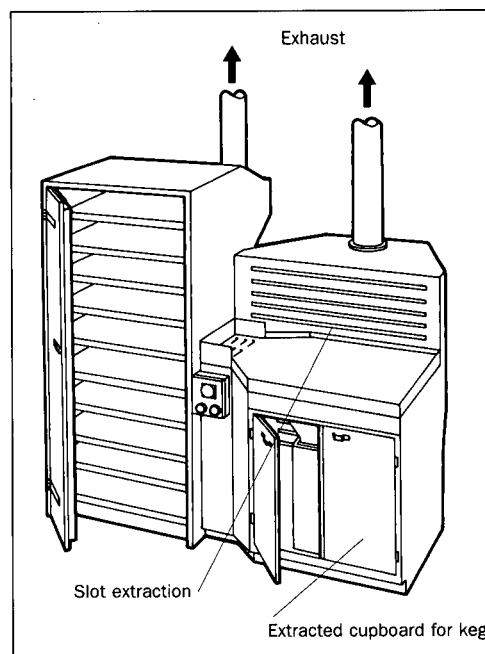
Design and equipment

- ✓ Provide arrangements for filling and emptying trays.
- ✓ Provide local exhaust ventilation at the tray emptying point - see diagram. The inward air flow at the tipping point should be at least 1 metre per second.

- ✓ Oven doors should be sturdy and close securely.

- ✓ Ventilation should be applied to the oven to remove vapour generated during drying.
- ✓ Oven ventilation should be sufficient to maintain the oven at a lower pressure than the surrounding air.
- ✓ Where flammable solvents are used, the ventilation of the oven should be sufficient to ensure that the solvent vapour in air concentration never exceeds 25% of the lower explosive limit. See the safety data sheet for information.

- ✓ Explosion relief should be provided on the oven if flammable solvents are used, and should also be considered for combustible solids.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading vapour.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ For dusts, clean filtered air can be recirculated to the workroom.
- ✗ With vapours, air re-circulation is not recommended.



Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in efficient and effective working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and dispose of empty containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.
- ✗ Don't use dry brushing or cleaning with compressed air.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- *Safe handling of combustible dusts* HSG103 HSE Books 1994 ISBN 0 7176 0725 9.
- *User guide to fire and explosion hazards in the drying of particulate materials* Institution of Chemical Engineers 1977.
- Control guidance sheets 101, 204, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that paper bags and other waste material are not drawn into the ventilation duct.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb with granules or mats. For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



COSHH essentials:
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Continuous drying labyrinth oven

Engineering control

229



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on medium and large-scale drying tasks using a continuous drying labyrinth oven. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

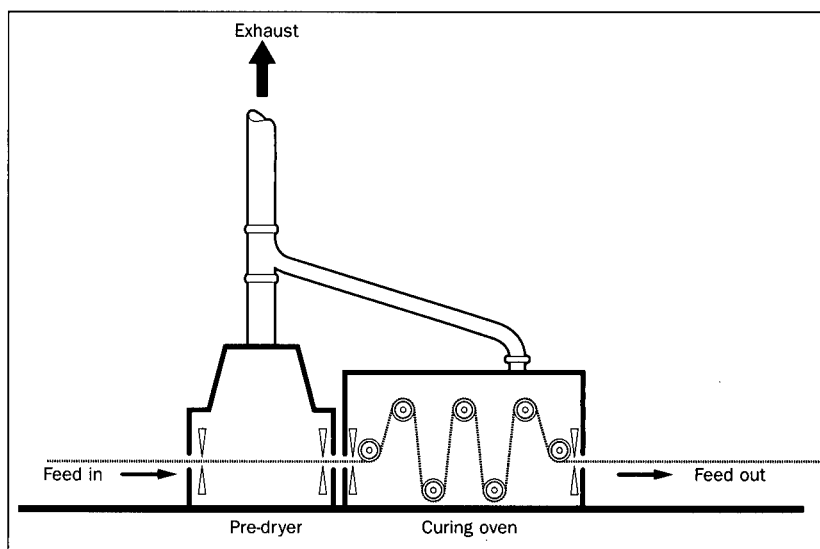
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Good thermal insulation should be applied.
- ✓ Air knives should be applied to the entry and exit points to the pre-dryer and labyrinth oven (to prevent vapour loss and contamination).
- ✓ Lights/signs should clearly indicate when the oven is in use.
- ✓ Exhaust ventilation systems should be easily controllable, interlocked to the oven heating controls and fitted with warning lights/alarms.
- ✓ When the oven is in use, the extraction should be balanced to a minimum level to maintain a slight negative pressure within the oven. Airflow should be sufficient to ensure that vapour concentrations within the oven are kept well below lower explosive concentration limits (refer to the safety data sheet).



- ✓ Explosion relief should be provided on the oven if flammable solvents are used.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading vapour.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✗ With vapours, air re-circulation is not recommended.

Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in efficient and effective working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and dispose of empty containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should normally be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb with granules or mats. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Pelletising

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Engineering control

Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of

the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on pelletising medium and large-scale quantities of solids. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

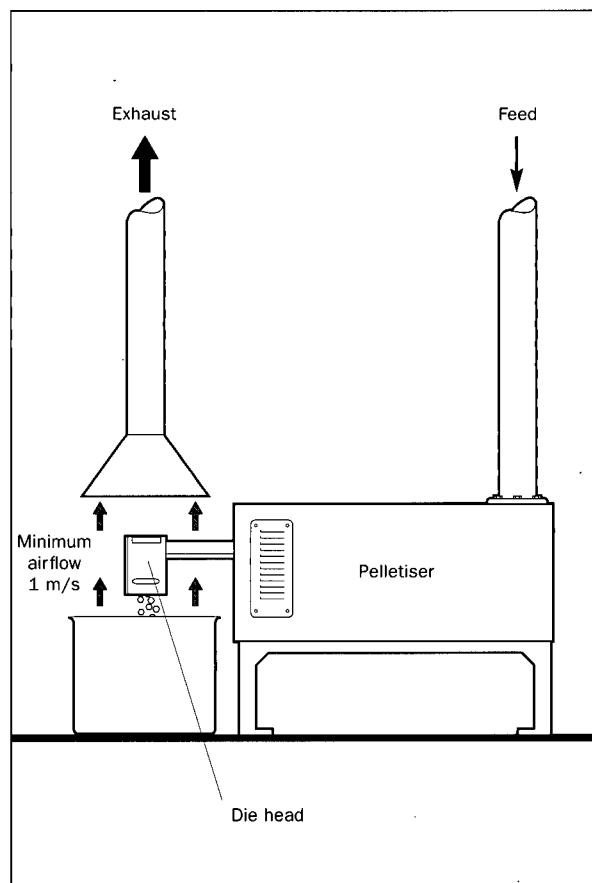
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Position the exhaust hood close to and over the discharge point.
- ✓ If necessary, provide articulated joints in the exhaust duct to allow the hood to be moved, eg to allow good access to the pelletising head for maintenance or repair. Alternatively, a short section of flexible duct may be used.
- ✓ The air flow across the discharge chute should be at least 1 metre per second.
- ✓ Ensure that safeguards are provided to minimise the risks arising from other hazards eg contacts with hot surfaces and ejection of liquid under high pressure.
- ✓ Provide good lighting. It should be suitable for the chemical(s) and task, eg dust tight or flameproof.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dust or vapour.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ With dusts you can re-circulate clean, filtered air into the workroom.
- ✗ With vapours, re-circulation is not recommended.



Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in efficient and effective working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and dispose of empty containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.
- ✗ Don't use dry brushing or cleaning with compressed air.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, 204, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that paper bags and other waste material are not drawn into the ventilation duct.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb with granules or mats. For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Tablet press

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Engineering control

Control approach 2



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 2 - engineering control - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on pressing tablets from medium-scale quantities of solids. It describes the key points you need to follow to help reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

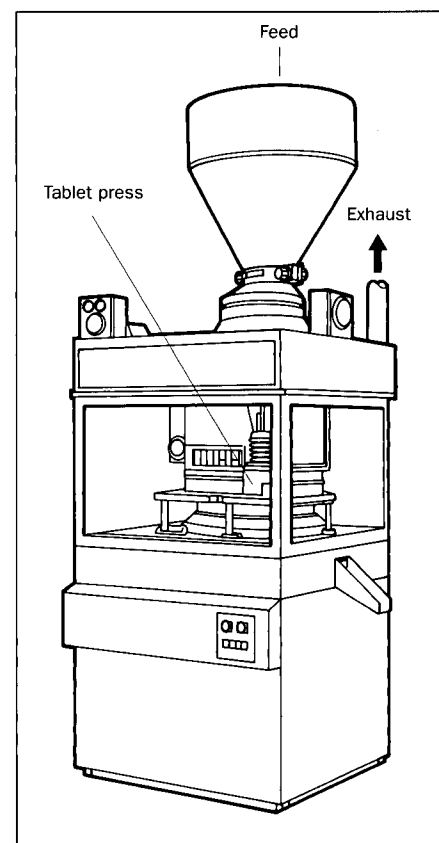
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Restrict access to the work area to authorised staff only.

Design and equipment

- ✓ Where possible, enclose the solids transfer system.
- ✓ Provide local exhaust ventilation around the tablet press with an inward air flow of at least 1 metre per second at the point where dust is generated.
- ✓ Consider the need for additional ventilation at the tablet discharge and transfer points.
- ✓ Ensure air discharges from pneumatic systems do not interfere with the dust control measures.
- ✓ Locate the tablet machine within an enclosure to help contain dust.
- ✓ Design any enclosure in sections to allow easy access for cleaning and maintenance. For food and drug products, take account of cleaning requirements.
- ✓ Hinged doors should be provided for routine inspection.
- ✓ Ensure that safeguards are provided to prevent contact with moving parts of machines and other hazards, eg hot sealing.
- ✓ Where possible, locate the work area away from doors, windows and walkways to stop draughts interfering with the ventilation and spreading dust and vapour.
- ✓ Provide an air supply to the workroom to replace extracted air.
- ✓ Keep ducts short and simple, and avoid long sections of flexible duct.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from windows and air inlets.
- ✓ With dusts you can re-circulate clean, filtered air into the workroom.
- ✗ With vapours, re-circulation is not recommended.



Maintenance

- ✓ Maintain the equipment as advised by the supplier/installer, in efficient and effective working order.

Examination and testing

- ✓ Get information on the design performance of the ventilation equipment from the supplier. Keep this information to compare with future test results.
- ✓ Visually check the ventilation equipment at least once a week for signs of damage.
- ✓ Have ventilation equipment examined and tested against its performance standard - generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✓ Store containers in a safe place and dispose of empty containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.
- ✗ Don't use dry brushing or cleaning with compressed air.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Keep PPE clean, and replace it at recommended intervals.

Training

- ✓ Give your workers information on the harmful nature of the substance.
- ✓ Provide them with training on: handling chemicals safely; checking controls are working and using them; when and how to use any PPE you provide; and what to do if something goes wrong.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, 204, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any ventilation system is switched on and is working.
- Make sure it is running properly; check the manometer, pressure gauge or tell-tale.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that paper bags and other waste are not drawn into the ventilation duct.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Containment

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Containment



This guidance sheet is aimed at employers to help them comply with the requirements of

the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on containment, and can be applied to a range of tasks involving small, medium or large-scale use of solids and liquids. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

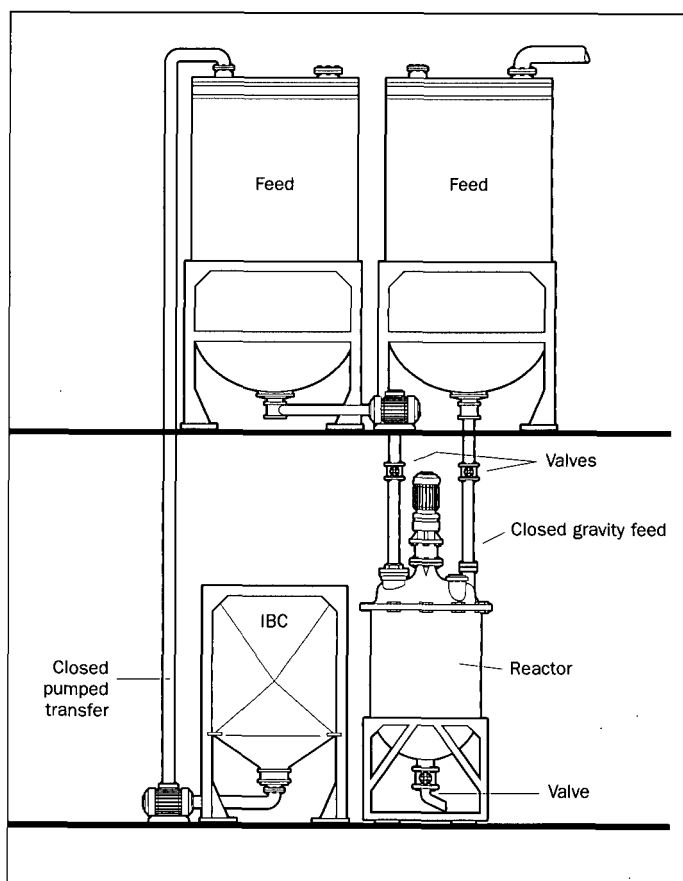
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Control staff entry to the work area.
- ✓ Work area and equipment should be clearly labelled.

Design and equipment

- ✓ You need to use closed systems to a standard normally used in industry. Limited breaching of containment is allowed, for example taking quality control samples.
- ✓ Design the closed system to allow easy maintenance.
- ✓ Where possible, keep equipment under negative pressure to stop leaks.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Get information from the supplier on all parameters needed to safely operate the system.



Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order, and in good repair.

- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.
- ✗ Don't enter any confined space until it has been checked for hazardous materials and oxygen content (see HSE publication INDG258).

Examination and testing

- ✓ Visually check all equipment at least once a week for signs of damage.
- ✓ Have equipment thoroughly examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Clean equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Store packages/containers in a safe place, and dispose of empty packages/containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.
- ✓ Deal with any spills immediately.
- ✗ For dusts, don't clean up with a dry brush or compressed air, use a vacuum system or wet cleaning.
- ✓ For liquids, contain or absorb (with granules or mats).

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) shouldn't be needed for routine tasks. It may be needed for some cleaning and maintenance activities, eg dealing with spills. Be aware that some maintenance activity may involve entry into confined spaces. Decide if supplied air is needed when RPE is used.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that control measures are in place and are being followed.

Further information

- Safety data sheets.
- *Work in confined spaces* INDG258 HSE Books 1997.
- Control guidance sheets 101, 204, 302, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any ventilation system is switched on and working.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb spills with granules or mats. For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Glove box

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Containment

Control approach 3



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on using a glove box, and can be applied to a range of tasks involving small-scale use of solids and liquids. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

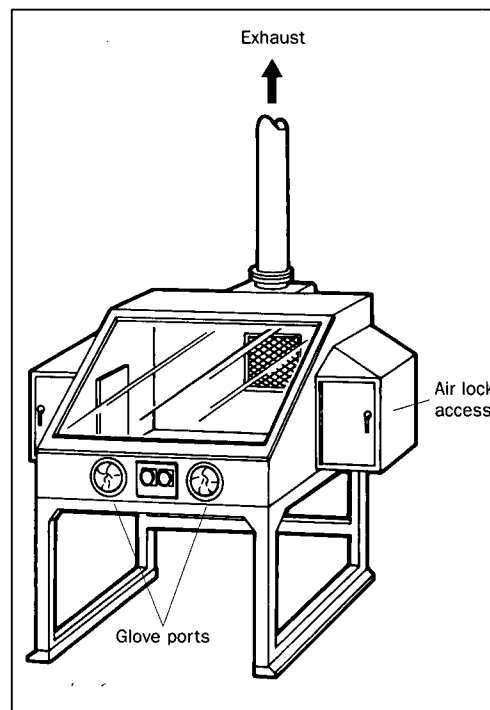
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Control staff entry to the work area.
- ✓ Work area and equipment should be clearly labelled.

Design and equipment

- ✓ Surfaces inside the glove box should be smooth, impermeable and easily decontaminated. Strippable plastic coating can be used to simplify decontamination.
- ✓ Provide one or more air locks.
- ✓ In some situations (for example, where gas flames are required within the unit), filter units must be fitted on the access doors to allow airflow into the unit.
- ✓ Electrical and other services required within the glove box should have their controls positioned outside the unit.
- ✓ Gloves should be resistant to the chemicals being used, and sealed to the glove ports.
- ✓ Provide good lighting. Select lighting equipment suitable for the nature of the chemicals and processes, eg dust tight or flameproof.
- ✓ Apply ventilation to achieve a slight negative pressure. Use a disposable filter on the inlet to the system.
- ✓ The exhaust from the glove box usually needs to be passed through a suitable scrubber or high efficiency particle arrestor (HEPA) filter before discharge.
- ✓ Design the glove box to allow easy maintenance.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.



Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.
- ✓ Disposable and HEPA filters should be replaced as required.

Examination and testing

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.
- ✓ Ensure any extraction equipment is thoroughly examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Store packages/containers in a safe place, and dispose of empty packages/containers safely (see CGS 101).
- ✓ Put lids on containers immediately after use.
- ✓ Deal with any spills immediately.
- ✗ For dusts, don't clean up with a dry brush or compressed air, use a vacuum system or wet cleaning.
- ✓ For liquids, contain or absorb (with granules or mats).

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) should not normally be necessary for routine operations. It may be needed for some cleaning and maintenance activities, eg dealing with spills.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that all control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the ventilation system is switched on and working.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Make sure that paper bags and other waste material are not drawn into the ventilation duct.
- Make sure that all required items are placed in the air lock before starting work.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb with granules or mats. For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Removing waste from a dust extraction unit

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Containment

Control approach 3



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on removing waste from a large-scale dust extraction or air cleaning unit. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

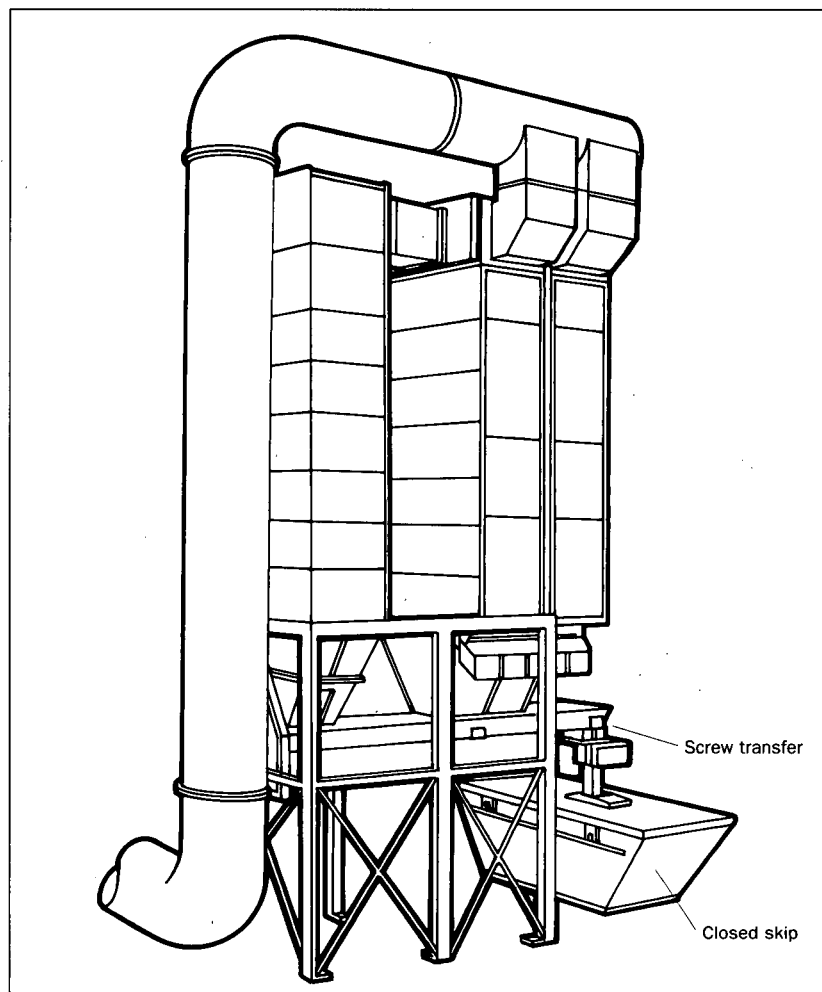
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Control staff entry to the work area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ Locate the dust extraction unit outside, away from doors and windows.
- ✓ Consider the need for explosion relief for combustible solids and ensure that equipment is appropriately earthed.
- ✓ Avoid overfilling - provide a means of telling when the waste skip is full.
- ✓ Provide a shut-off valve on the discharge line.
- ✓ Dispose of waste in accordance with environmental legislation.
- ✓ Design the work area and closed system for ease of maintenance and, when possible, use equipment designed for easy maintenance.
- ✓ Where operational factors permit, keep the process equipment under negative pressure to prevent leakage.



Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.

Examination and testing

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check all equipment at least once a week for signs of damage.
- ✓ Ensure any extraction equipment is thoroughly examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Ensure the skip is replaced regularly.
- ✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately.
- ✗ Don't use dry brushes or clean with compressed air, use vacuum cleaning or wet methods.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) should not normally be necessary for routine operations. It may be needed for some cleaning and maintenance activities, eg dealing with spills.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *Safe handling of combustible dusts* HSG103 HSE Books 1994 ISBN 0 7176 0725 9.
- Control guidance sheets 204, S100 and S101.

Employee checklist for making the best use of the controls

- Replace the skip on a regular basis - as per instructions and before it overfills.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Don't carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Deal with spills straight away. Use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Control approach 3



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on transferring medium and large quantities of solids. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Transferring solids

Containment

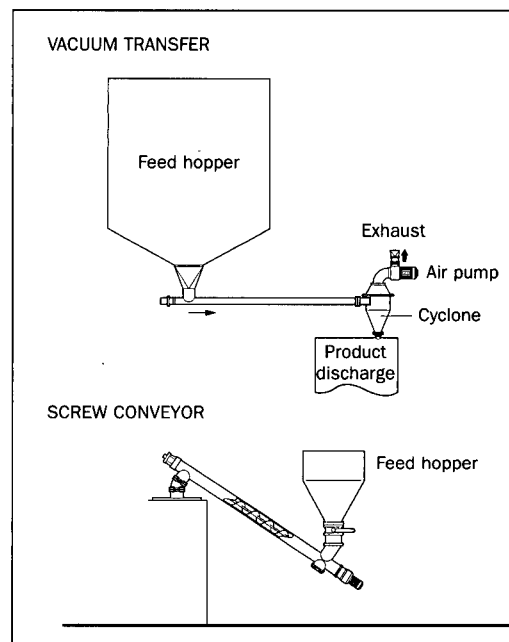
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Access

- ✓ Control entry to the working area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ Ensure the work area is well ventilated.
- ✓ Ensure the system is free of leaks and all joints have suitable seals.
- ✓ Take account of possible abrasion from the solids being transferred, and ensure suitably robust materials are used.
- ✓ Design the system in sections to allow easy access for cleaning and maintenance.
- ✓ Consider the need for explosion relief for combustible solids and ensure equipment is appropriately earthed.
- ✓ Provide an easy way of checking the control is working.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.



Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.

Examination and testing

- ✓ Obtain information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually inspect all equipment at least once a week for signs of damage.
- ✓ Ensure any extraction equipment is thoroughly examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Store packages/containers in a safe place. See CGS 101 for more specific advice on storage.
- ✓ Dispose of empty packages/containers safely.
- ✓ Put lids on containers immediately after use.
- ✓ Deal with spills immediately.
- ✗ Don't use dry brushing or cleaning with compressed air. Vacuum or wet clean.

Personal protective equipment (PPE)

- ✓ Materials allocated to **hazard group S** can harm the skin and eyes, or enter the body through the skin and cause harm (see CGS S100 and S101 for more specific advice). Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment should not normally be necessary for routine operations. It may be needed for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Safe handling of combustible dusts* HSG103 HSE Books 1994 ISBN 0 7176 0725 9.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- Control guidance sheets 101, 204, 302, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any ventilation system is switched on and is working.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



COSHH essentials:
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Sack emptying

304

Containment

Control approach 3



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on sack emptying, and can be applied to tasks involving medium quantities of solids. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

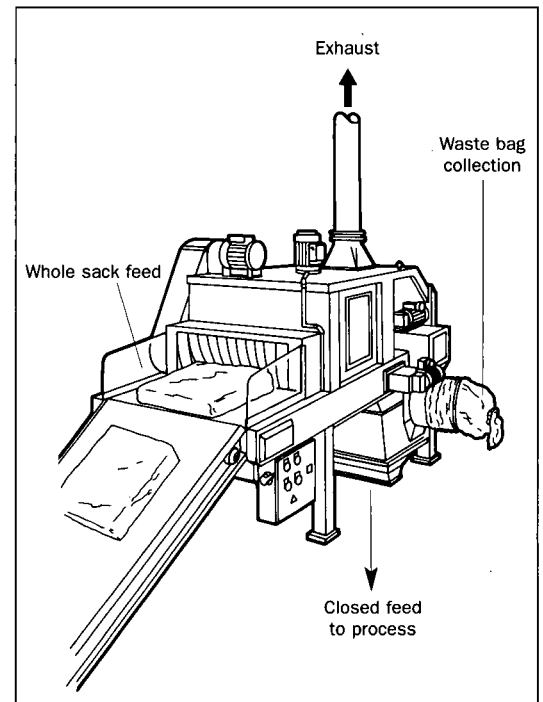
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Control staff entry to the work area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ Provide arrangements to strip and vacuum or wet clean the conveyor belt.
- ✓ Enclose the slit as much as possible - see diagram.
- ✓ Ensure an inward airflow of 1.0 metre per second at any opening into the enclosure.
- ✓ Keep all openings as small as possible - while allowing enough room for safe working. Use see-through panels and plastic strips to reduce the open area.
- ✓ Consider additional ventilation at the bag disposal point.
- ✓ Provide good lighting. Select lighting equipment suitable for the nature of the substances and processes, eg dust tight or flameproof, if needed.
- ✓ Design the system to allow easy maintenance.
- ✓ Where operational factors permit, keep the process equipment under negative pressure to prevent leakage.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.



Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.

Examination and testing (if a ventilation system is provided)

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.
- ✓ Ensure any extraction equipment is thoroughly examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Store packages/containers in a safe place (see CGS 101).
- ✓ Dispose of empty packages/containers safely.
- ✓ Put lids on containers immediately after use.
- ✓ Deal with spills immediately.
- ✗ Don't clean up with a dry brush or compressed air, use a vacuum system or wet cleaning.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what PPE equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) shouldn't be needed for routine tasks. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills. Be aware that some maintenance activity may involve entry into confined spaces. Decide if supplied air is needed when RPE is used.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, 204, 302, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any ventilation system is switched on and is working.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Avoid manual handling - use handling aids.
- Any damaged or leaking bags should be repacked away from the main storage area or disposed of safely. A responsible person should be involved to ensure this process is carried out safely.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



COSHH essentials:
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Drum filling

305

Containment

Control approach 3



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on drum filling involving medium or large quantities of liquids. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

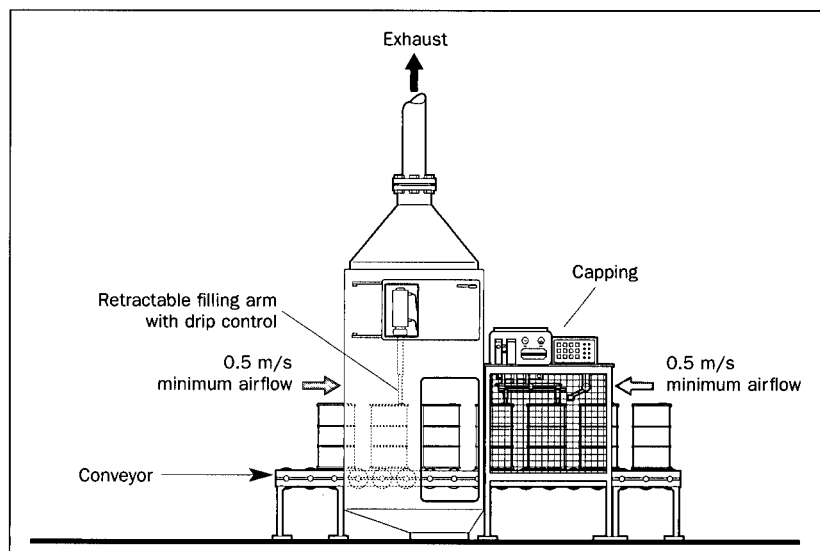
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Control staff entry to the work area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ Ensure the work area is well ventilated.
- ✓ Design the work area for ease of maintenance and, where possible, use equipment that has been designed for easy maintenance.
- ✓ Air flow at openings into the filling area and stopper fitting area should be at least 0.5 metre per second.
- ✓ Use a load cell or metered flow to prevent overfilling.
- ✓ Ensure a drip collector is fitted to the auto filling arm.
- ✓ Provide good lighting in the filling and stopper fitting area. Select lighting equipment suitable for the nature of the substances and processes, eg flameproof, if needed.
- ✓ Provide spillage containment in the filling area.



- ✓ For flammable liquids, ensure that suitable pumps/fans are used and ensure equipment is appropriately earthed.
- ✓ Where operational factors permit, keep the process equipment under negative pressure to prevent leaks.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient order, and good repair.

- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.

Examination and testing (if a ventilation system is provided)

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.
- ✓ Ensure any extraction equipment is thoroughly examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately. Contain or absorb spills using mats or granules.
- ✓ Store packages/containers in a safe place (see CGS 101).
- ✓ Dispose of empty packages/containers safely.
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) should not normally be necessary for routine operations. It may be needed for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that all control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any ventilation system is switched on and is working.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb with granules or mats. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



COSHH essentials:
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Drum emptying

306

Containment

Control approach 3



This guidance sheet is aimed at employers to help them comply with the requirements of

the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on drum emptying involving medium quantities of liquids. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

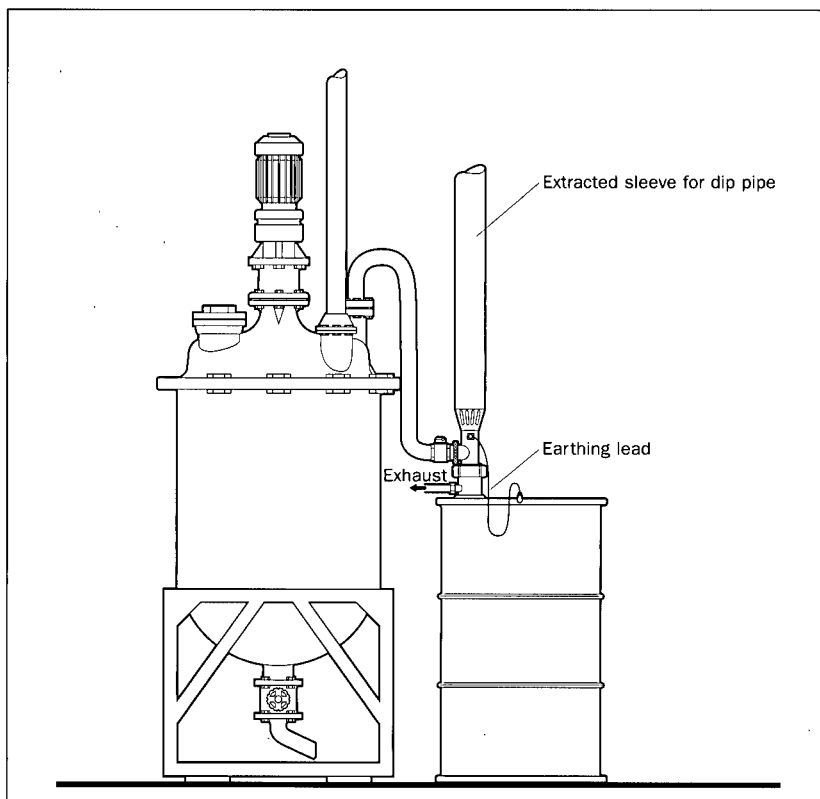
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Control staff entry to the work area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ Ensure the work area is well ventilated.
- ✓ Design the work area for ease of maintenance and, when possible, use equipment that has been designed for easy maintenance.
- ✓ Provide containment or an extracted sleeve to prevent drips and leaks when the dip pipe is removed.
- ✓ Ensure the pump is suitable for the liquid to be transferred.
- ✓ Avoid manual handling. Consider how the drum will be moved to the transfer area.
- ✓ Provide a suitable 'key' for removing and replacing the drum stopper.
- ✓ For flammable liquids, ensure that suitable pumps/fans are used and that they are properly earthed to prevent sparks from static electricity.
- ✓ Where operational factors permit, keep the process equipment under negative pressure to prevent leaks.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.



Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order, and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.

Examination and testing

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.
- ✓ Ensure any extraction equipment is thoroughly examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately. Contain or absorb liquid spills with granules or mats.
- ✓ Store drums in a safe place. See CGS 101 for more specific advice on storage.
- ✓ Dispose of empty drums safely.
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) should not normally be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg dealing with spills.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that all control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any ventilation system is switched on and is working.
- Always remove and replace the drum stopper using a 'key'.
- Always use the earth strap.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb with granules or mats. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



COSHH essentials:
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IBC filling and emptying (solids)

307

Containment

Control approach 3



This guidance sheet is aimed at employers to help them comply with the requirements of

the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on filling and emptying IBCs (International bulk carriers) with large quantities of solids. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

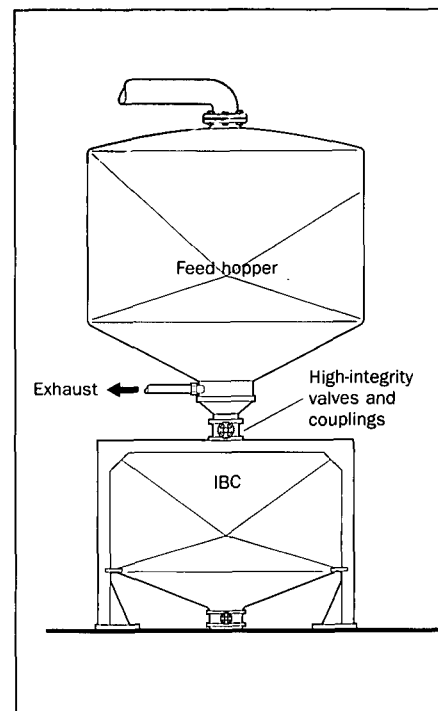
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Control staff entry to the work area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ Ensure the IBC is designed and constructed for the material it will contain.
- ✓ Use high-integrity valves and couplings to make connections.
- ✓ Take precautions to prevent overfilling, eg load cells.
- ✓ Provide a means to isolate and/or control the filling rate.
- ✓ Make arrangements for air displaced during filling to vent to a safe place, eg back into the supply tank.
- ✓ Provide seals on access hatches.
- ✓ Ensure the high-integrity valve does not leak.
- ✓ Provide good lighting. Select lighting equipment suitable for the nature of the substances and processes, eg dust tight or flameproof.
- ✓ Provide good access for fork-lift trucks.
- ✓ Provide barriers and notices.
- ✓ Consider the need for explosion relief for combustible solids, and ensure equipment is appropriately earthed.
- ✓ Provide an easy way of checking the control is working, eg a manometer, pressure gauge or tell-tale.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.



Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order, and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.

Examination and testing

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.
- ✓ Ensure any extraction equipment is thoroughly examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Store containers in a safe place (see CGS 101).
- ✓ Dispose of empty containers safely.
- ✓ Put lids on containers immediately after use.
- ✓ Deal with spills immediately.
- ✗ Don't clean up with a dry brush or compressed air, use a vacuum system or wet cleaning.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) should not normally be necessary for routine tasks. It may be needed for some cleaning and maintenance activities, eg dealing with spills.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that all control measures are in place and being followed.

Further information

- Safety data sheets.
- *Safe handling of combustible dusts* HSG103 HSE Books 1994 ISBN 0 7176 0725 9.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- Control guidance sheets 101, 204, 302, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any ventilation system is switched on and is working.
- Take care not to overfill the IBC.
- Ensure barriers and warning notices are in position.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



COSHH essentials:
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IBC filling and emptying (liquids)

308

Containment

Control approach 3



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on filling and emptying IBCs (international bulk carriers) with large quantities of liquids. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

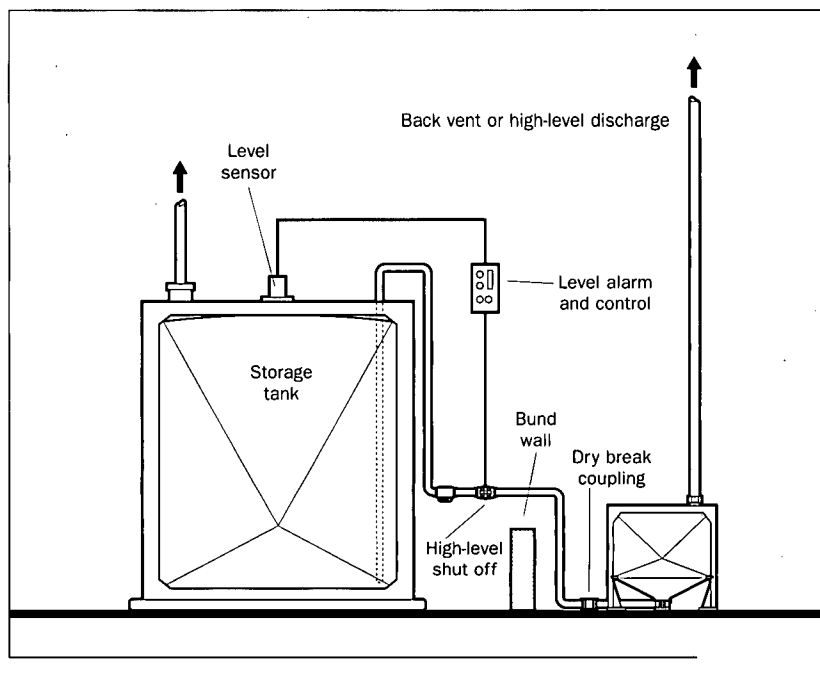
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Control staff entry to the working area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ The connection points on the vessel to be filled should comprise a fill pipe, level sensor and a vapour outlet.
- ✓ The level sensor/load cell should be connected to an automatic shut-off valve or filling pump.
- ✓ The joints around connection points should be effectively sealed.
- ✓ Bottom filling is preferred, otherwise the length of the fill pipe should enable it to be submerged during filling.
- ✓ Dedicated coupling lines should be used and dry break couplings considered.
- ✓ Hosing used for filling should be of a suitable length.
- ✓ Ensure connections are within areas with spillage containment.
- ✗ Do not use splash loading.
- ✓ For flammable liquids, ensure that suitable pumps/fans are used and that equipment is appropriately earthed.
- ✓ The illustration shows one design of an IBC emptying installation. Consult your supplier for further information.
- ✓ Provide good lighting in the emptying/filling area. Select lighting equipment suitable for the nature of the substances and processes, eg flameproof.
- ✓ Design the closed system to allow easy maintenance.
- ✓ Discharge vented air to a safe place away from doors, windows and air inlets.



Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order, and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.

Examination and testing

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.
- ✓ Ensure any ventilation equipment is examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately. Contain or absorb with granules or mats.
- ✓ Store containers in a safe place (see CGS 101).
- ✓ Dispose of empty containers safely.
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) should not be needed for routine tasks. It may be needed for some cleaning and maintenance activities, eg dealing with spills.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that all control measures are in place and being followed.

Further information

- Safety data sheets.
- Certain chemical suppliers provide technical guidance on liquids storage and transfer.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any ventilation is working.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Ensure that all couplings are correctly connected.
- Barrier off the emptying area.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb spills with granules or mats. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Tanker filling and emptying (solids)

309

Containment

Control approach 3



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on filling and emptying tankers with large quantities of solids. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

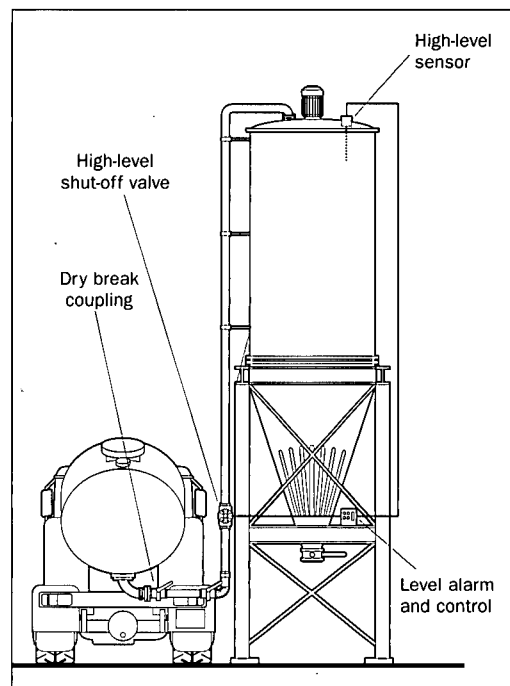
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Control staff entry to the work area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ Ensure the silo is designed and constructed for the material it will contain.
- ✓ Provide arrangements to allow clean, preferably dry air to enter the silo as material is drawn off.
- ✓ Provide seals on access hatches.
- ✓ Provide a valve to control the rate of discharge from the base of the silo.
- ✓ Ensure the valve connection to the transfer pipe is dust tight.
- ✓ Consider means of dealing with blockages and bridging within the silo. Whenever possible, these should be cleared from outside the silo.
- ✓ Take precautions to avoid overfilling of the silo, eg high-level indicator, load cells.
- ✓ Provide dust filtration for air displaced from the silo during filling, and discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Consider the need for explosion relief for combustible solids, and ensure that equipment is appropriately earthed.
- ✓ Design silo to prevent over-pressurisation.
- ✓ Design the closed system to allow easy maintenance.



Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order, and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.
- ✗ Do not enter a silo until it has been checked for hazardous substances and oxygen content.

Examination and testing (if a ventilation system is provided)

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Store packages/containers in a safe place (see CGS 101).
- ✓ Dispose of empty packages/containers safely.
- ✓ Put lids on containers immediately after use.
- ✓ Deal with spills immediately.
- ✗ Don't clean up with a dry brush or compressed air, use a vacuum system or wet cleaning.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) should not normally be needed for routine operations. It may be needed for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that all control measures are in place and being followed.

Further information

- Safety data sheets.
- *Work in confined spaces* INDG258 HSE Books 1997.
- *Safe handling of combustible dusts* HSG103 HSE Books 1994 ISBN 0 7176 0725 9.
- Control guidance sheets 101, 204, 302, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any ventilation system is switched on and working.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Clear bridges/blockages from outside the silo. A 'permit to work' will be required for entry into the silo.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



COSHH essentials:
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3

Control approach 3



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on filling and emptying tankers with large quantities of liquids. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Tanker filling and emptying (liquids)

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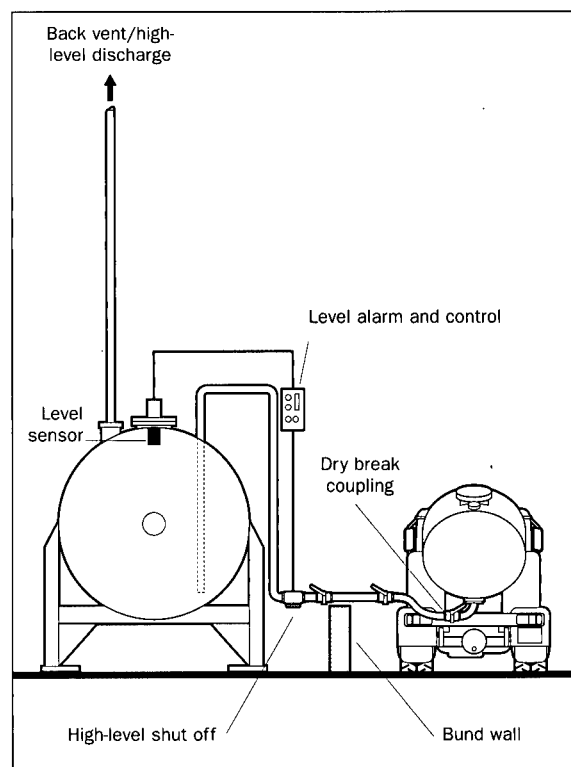
Containment

Access

- ✓ Control staff entry to the working area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ The connection points on the vessel to be filled should comprise a fill pipe, a level sensor and a vapour outlet.
- ✓ The level sensor/load cell should be connected to an automatic shut-off valve or filling pump.
- ✓ The joints around connection points should be effectively sealed.
- ✓ Bottom filling is preferred, otherwise the length of the fill pipe should enable it to be submerged during filling.
- ✓ A pressure vacuum valve should be fitted on the tanker.
- ✓ Dedicated coupling lines should be used and dry break couplings considered.
- ✓ Provide good lighting in the emptying/filling area. Select lighting equipment suitable for the nature of the substances and processes, eg flameproof.
- ✓ Hosing used for filling should be of a suitable length.
- ✓ Ensure connections are within areas with spillage containment.
- ✗ Do not use splash loading.
- ✓ For flammable liquids, ensure that suitable pumps/fans are used and that equipment is appropriately earthed.
- ✓ Design the closed system to allow easy maintenance.
- ✓ Discharge vented air to a safe place away from doors, windows and air inlets.



Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order, and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.

Examination and testing

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the work room regularly - once a week is recommended.
- ✓ Deal with spills immediately. Contain or absorb with granules or mats.
- ✓ Store containers in a safe place (see CGS 101).
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) should not be needed for routine tasks. It may be necessary for some cleaning and maintenance activities, eg dealing with spills.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that all control measures are in place and being followed.

Further information

- Safety data sheets.
- Certain chemical suppliers provide technical guidance on liquids storage and transfer.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Ensure that all couplings are correctly connected.
- Barrier off the emptying area.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away.
- Use, maintain and store any PPE provided in accordance with instructions.



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Control approach 3



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on filling kegs with medium quantities of solids. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Filling kegs

Containment

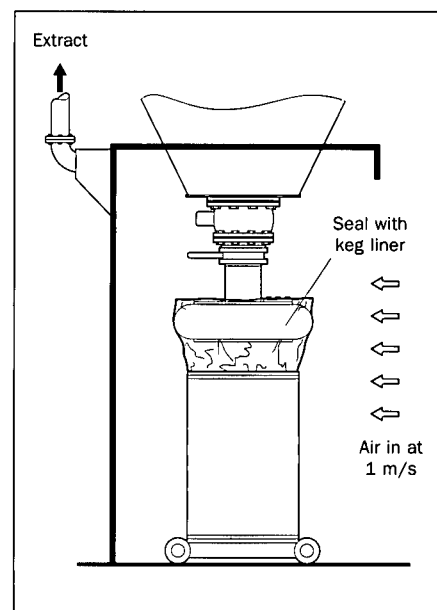
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Access

- ✓ Control staff entry to the working area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ Ensure the kegs and filling equipment are compatible and well maintained.
- ✓ Provide suitable seals (eg inflatable rings) between the keg and filling head.
- ✓ Provide compatible keg liners for the material(s) being handled. Ensure liners are large enough to be easily tied off.
- ✓ Select kegs for maximum airtightness, eg lipped and with ring clamps.
- ✓ Provide a ventilated enclosure around the filling operation with an inward air flow of at least 1 metre per second.
- ✓ Ensure the filling head does not discharge dust when the keg is removed.
- ✓ Provide a tray or grid below the filling point to minimise the spread of contamination.
- ✓ Provide good lighting. Select lighting equipment suitable for the nature of the substances and processes, eg dust tight or flameproof.
- ✓ Consider handling methods, and provide suitable handling aids to minimise manual handling.
- ✓ Consider the need for explosion relief for combustible solids, and ensure that equipment is appropriately earthed.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.



Maintenance

- ✓ Ensure all equipment used in the task (especially the seal) is maintained as advised by the supplier/installer, in effective and efficient working order, and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.

Examination and testing

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.
- ✓ Ensure any extraction equipment is thoroughly examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records for all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the work area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Store containers in a safe place (see CGS101).
- ✓ Dispose of empty containers safely.
- ✓ Put lids on containers immediately after use.
- ✓ Deal with spills immediately.
- ✗ Don't clean up with a dry brush or compressed air, use a vacuum system or wet cleaning.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) should not normally be needed for routine operations. It may be needed for some cleaning and maintenance activities, eg dealing with spills.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that all control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- *Safe handling of combustible dusts* HSG103 HSE Books 1994 ISBN 0 7176 0725 9.
- Control guidance sheets 101, 204, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any ventilation system is switched on and working.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Do not use misshapen containers.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Transferring liquid by pump

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Containment

Control approach 3



This guidance sheet is aimed at employers to help them comply with the requirements of

the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on transferring medium and large quantities of liquids by pump. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

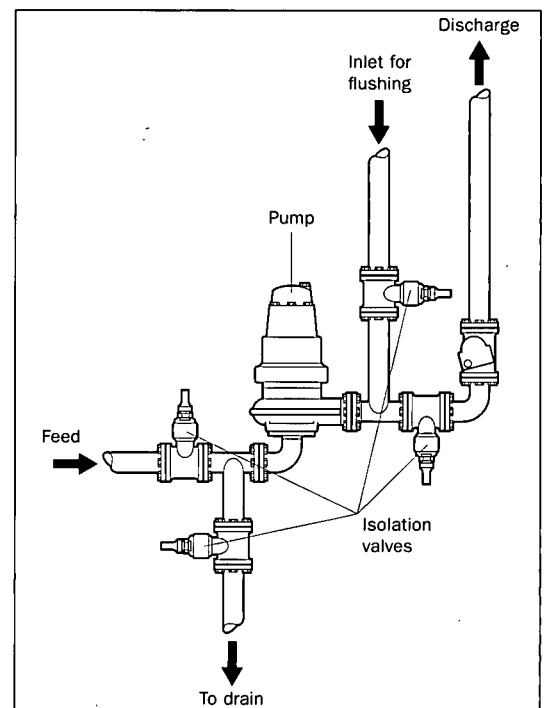
- ✓ Control staff entry to the work area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ Design the closed system to allow easy maintenance.
- ✓ Ensure seals, gaskets and valve packings are suitable for the intended use.

Fixed pipeline

- ✓ Ensure that the pipeline, including branches, is designed to relevant standards.
- ✓ Minimise the number of branches and deadlegs.
- ✓ All pipelines should be properly supported and protected from damage by vehicles.
- ✓ Ensure pipelines have sufficient flexibility to allow for thermal expansion.
- ✓ Provide compatible gaskets and seals for flanges and connections.
- ✓ Provide slip plates or valves to isolate sections of pipe from plant.
- ✓ Provide arrangements for draining/flushing sections of pipe, and for safe disposal of residues.
- ✓ Provide precautions against static discharge.
- ✓ Consider means of dealing with blockages, eg steam inlets or rodding eyes. Provide a written procedure.



Flexible piping

- ✓ Ensure the hose and coupling are to the appropriate standard.
- ✓ Use bolted clips **not** jubilee clips.
- ✓ Consider the need for rapid isolation in the event of an emergency.

Pump

- ✓ Select a pump (and seals/gaskets) suitable for the material to be pumped and for the required flow rate.

- ✓ Protect the pump against overheating and over-pressure, eg pressure relief valves.
- ✓ Provide arrangements for draining/flushing sections of pumps and for safe disposal of residues.
- ✓ Make provision for the maintenance and replacement of the pump, eg isolation valves, slip plates.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order, and good repair.
- ✓ Adopt a 'permit to work' system for all operations where pipe connections must be undone.
- ✓ Provide written procedures for all maintenance tasks.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.

Examination and testing

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Store containers in a safe place (see CGS 101).
- ✓ Deal with spills immediately. Contain or absorb with granules or mats.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) should not normally be needed for routine tasks. It may be needed for some cleaning and maintenance activities, eg dealing with spills.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that all control measures are in place and being followed.

Further information

- Safety data sheets.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.

Wash your hands before and after eating, drinking or using the lavatory.

Do not use solvents to clean your skin.

Clear up spills straight away. For liquids, contain or absorb with granules or mats. Dispose of spills safely.

Use, maintain and store any PPE provided in accordance with instructions.



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Packet filling

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Containment

Control approach 3



This guidance sheet is aimed at employers to help them comply with the requirements of

the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on filling packets with medium and large quantities of solids using a form fill and seal machine as an example. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

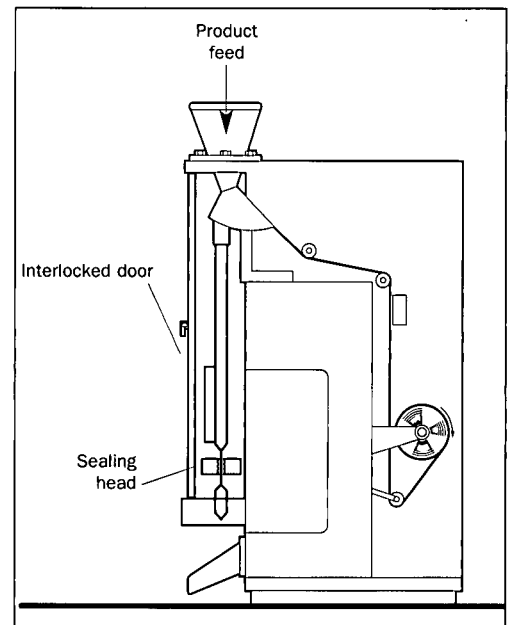
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Control staff entry to the work area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ Enclose the solids transfer system as much as possible.
- ✓ Integrate the weighing/bagging system to minimise open transfer. Provide an enclosure around the weighing/bagging heads.
- ✓ Extend the enclosure to cover the area where the packet is closed and sealed.
- ✓ Design the enclosure to ensure that the high-velocity pressure jets from pneumatic system discharges do not breach the containment.
- ✓ Design the enclosure in sections to allow easy access for cleaning and maintenance. For food products, take account of regular cleaning requirements.
- ✓ Provide dust curtains at the open ends of the enclosures, eg transfer conveyors for filled packets.
- ✓ Keep the process equipment under negative pressure to prevent leakage.
- ✓ The inward air flow at all openings in the enclosure should be at least 1 metre per second.
- ✓ Hinged doors should be provided for routine inspection.
- ✓ Provide safeguards to prevent contact with moving parts of machines and other hazards, eg hot glue application.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.
- ✓ Consider the need for explosion relief for combustible solids.



Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order, and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.

Examination and testing

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.
- ✓ Ensure any ventilation equipment is examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the storage area daily. Clean other equipment and the work room regularly - once a week is recommended.
- ✓ Store packages/containers in a safe place (see CGS 101).
- ✓ Dispose of empty packages/containers safely.
- ✓ Put lids on containers immediately after use.
- ✓ Deal with spills immediately.
- ✗ Don't clean up with a dry brush or compressed air, use a vacuum system or wet cleaning.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) should not normally be needed for routine operations. It may be needed for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that all control measures are in place and being followed.

Further information

- Safety data sheets
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- *Safe handling of combustible dusts* HSG103 HSE Books 1994 ISBN 0 7176 0725 9.
- Control guidance sheets 101, 204, 302, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any ventilation system is switched on and is working.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Bottle filling

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Containment

Control approach 3



This guidance sheet is aimed at employers to help them comply with the requirements of

the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on filling bottles with medium and large quantities of liquids. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

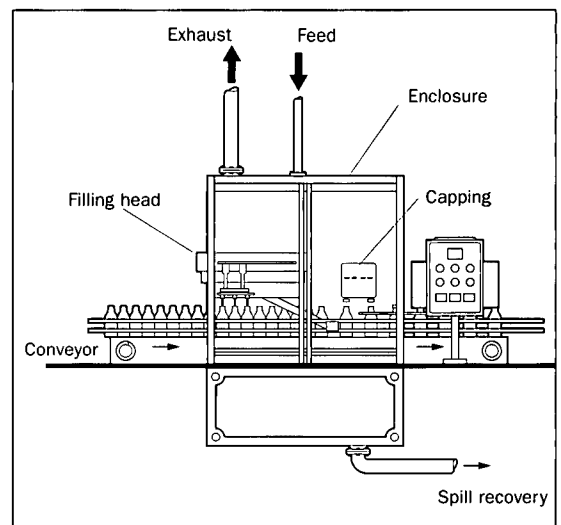
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Control staff entry to the work area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ Enclose the liquid transfer system as much as possible.
- ✓ Integrate the weighing/volume measurement system to minimise open transfer. Provide an enclosure around the filling heads.
- ✓ Design the enclosure to ensure that the high-velocity pressure jets from pneumatic system discharges do not breach the containment.
- ✓ Design the enclosure in sections to allow easy access for cleaning and maintenance. For food products, take account of regular cleaning requirements.
- ✓ Provide curtains at the open ends of the enclosures, eg on transfer conveyors for filled containers.
- ✓ Keep the process equipment under negative pressure to prevent leakage.
- ✓ The inward air flow at all openings in the enclosure should be at least 0.5 metre per second.
- ✓ Hinged doors should be provided for routine inspection.
- ✓ Provide a spillage containment/removal system.
- ✓ Consider the need for an inert atmosphere for flammable material.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.



Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order, and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.
- ✗ Do not enter a confined space until it has been checked for hazardous materials and oxygen content.

Examination and testing

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.
- ✓ Ensure any extraction equipment is thoroughly examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately. For liquids, contain or absorb spillages with granules or mats.
- ✓ Store containers in a safe place (see CGS 101).
- ✓ Dispose of empty containers safely.
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) should not normally be needed for routine operations. It may be needed for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that all control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *An introduction to local exhaust ventilation* HSG37 HSE Books 1993 ISBN 0 7176 1001 2.
- *Work in confined spaces* INDG258 HSE Books 1997.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any ventilation system is switched on and working.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb with granules or mats. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Weighing (solids)

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Containment

Control approach 3



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the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice on advice weighing medium and large quantities of solids. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

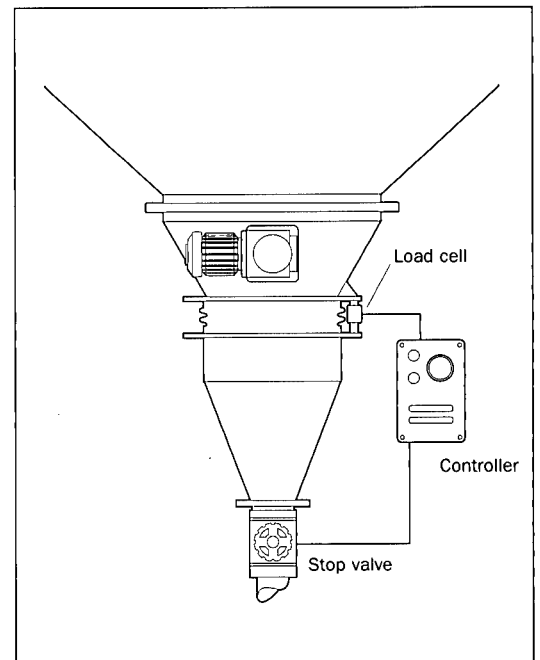
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Control staff entry to the work area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ Ensure the weigh vessel and associated pipework, valves and instrumentation are suitable for intended use.
- ✓ Ensure dust-tight connections between feed hopper, load cell and receiving container.
- ✓ Provide a controlled feeding device between the feed hopper and load cell.
- ✓ Provide as much space as possible within the enclosures. This will help contain the dust.
- ✓ Consider how to prevent or deal with blockages without breaching the integrity of the closed system, eg vibrating pads or pneumatic jets.
- ✓ Design the enclosure in sections to allow easy access for cleaning and maintenance.
- ✗ Do not allow entry to a feed hopper to remove a blockage without isolating the equipment, checking the atmosphere for oxygen deficiency and toxic gases, and selecting suitable PPE.
- ✓ Consider the need for explosion relief for combustible solids, and ensure that equipment is appropriately earthed.
- ✓ Keep the process equipment under negative pressure to prevent leaks.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.



Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.

Examination and testing

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.
- ✓ Ensure any extraction equipment is thoroughly examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Store packages/containers in a safe place (see CGS 101).
- ✓ Dispose of empty packages/containers safely.
- ✓ Put lids on containers immediately after use.
- ✓ Deal with spills immediately.
- ✗ Don't clean up with a dry brush or compressed air, use a vacuum system or wet cleaning.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) should not normally be needed for routine operations. It may be needed for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that all control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *Work in confined spaces* INDG258 HSE Books 1997.
- *Safe handling of combustible dusts* HSG103 HSE Books 1994 ISBN 0 7176 0725 9.
- Control guidance sheets 101, 204, 302, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any extraction system is switched on and working.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



COSHH essentials:
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Weighing liquids

316

Containment

Control approach 3



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on weighing medium and large quantities of liquids. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

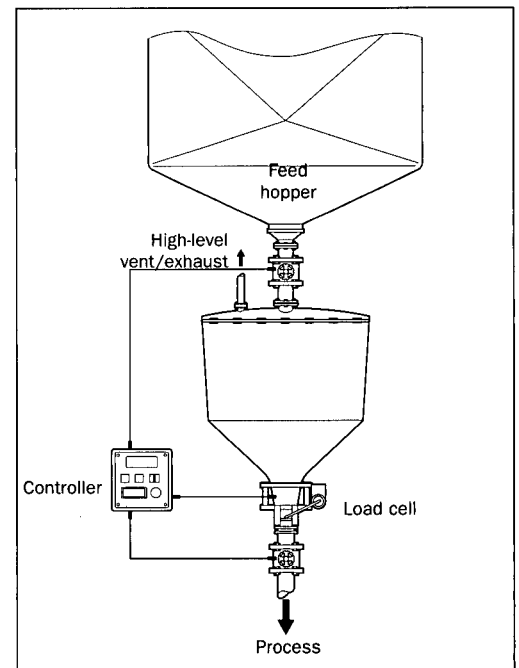
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Control staff entry to the work area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ Use load cells or metered flow devices to dispense fixed quantities of liquid using control approach 3.
- ✓ Ensure the weigh vessel, associated pipework, valves and instrumentation are suitable for the intended use.
- ✓ Where necessary, incorporate an agitation device within the weigh vessel.
- ✓ Provide venting to the weigh vessel. Either vent back to the storage vessel or discharge to a safe place away from doors, windows and air inlets.
- ✓ Provide a high-level alarm, eg to stop delivery pump and/or close the supply valve.
- ✓ Consider the need for additional protection against overfilling.
- ✓ For flammable liquids, ensure that suitable pumps/fans are used and that equipment is appropriately earthed.
- ✗ Do not allow entry to vessels for maintenance before ensuring the atmosphere is free of hazardous substances and contains sufficient oxygen.
- ✓ Design the closed system to allow easy maintenance.
- ✓ Keep the process equipment under negative pressure to prevent leaks.



Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order, and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.

Examination and testing

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.
- ✓ Ensure the ventilation equipment is examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the work room regularly - once a week is recommended.
- ✓ Deal with spills immediately. For liquids, use absorbent granules or mats.
- ✓ Store containers in a safe place (see CGS 101).
- ✓ Dispose of empty containers safely.
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) should not normally be needed for routine operations. It may be needed for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that all control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *Work in confined spaces* INDG258 HSE Books 1997.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any ventilation system is switched on and is working.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb with granules or mats. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



COSHH essentials:
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Mixing (solids)

317

Containment

Control approach 3



This guidance sheet is aimed at employers to help them comply with the requirements of

the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on mixing medium and large quantities of solids. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

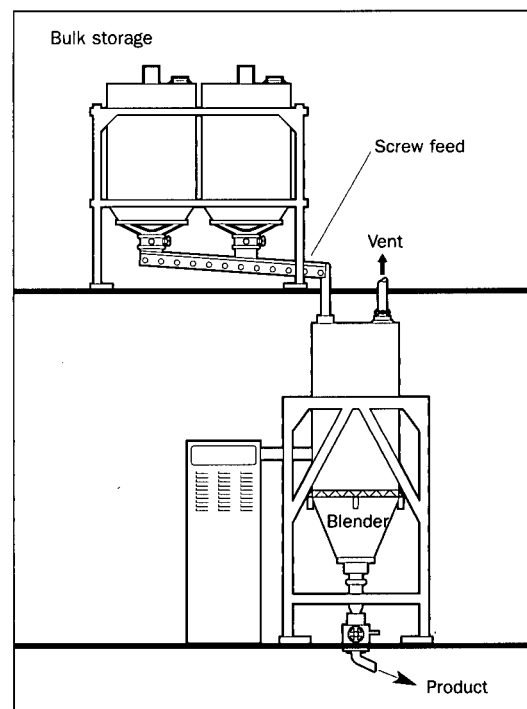
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Control staff entry to the work area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ Ensure the mixer, feed and discharge conveyors are enclosed as much as possible. Screw conveyors or pneumatic transfer are preferred.
- ✓ Provide suitable seals on the mixer, conveyor covers and other access points to minimise dust leaks.
- ✓ Ensure that lids, covers and other access points can be securely closed before operating the mixer.
- ✓ Ensure the materials used for construction, seals, gaskets, etc, are suitable for the intended use.
- ✓ Consider the need for arrangements to prevent over-pressurisation of the mixer, eg by venting to a safe place away from doors, windows and air inlets.
- ✓ Consider the need for explosion relief for combustible solids, and ensure that equipment is appropriately earthed.
- ✓ Design the closed system to allow easy maintenance and cleaning.
- ✓ Keep the process equipment under negative pressure to prevent leaks.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.



Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order, and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.

Examination and testing

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.
- ✓ Ensure any extraction equipment is thoroughly examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Store packages/containers in a safe place (see CGS 101).
- ✓ Dispose of empty packages/containers safely.
- ✓ Put lids on containers immediately after use.
- ✓ Deal with spills immediately.
- ✗ Don't clean up with a dry brush or compressed air, use a vacuum system or wet cleaning.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) should not normally be needed for routine operations. It may be needed for some cleaning and maintenance activities, eg cleaning up spills.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that all control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *Safe handling of combustible dusts* HSG103 HSE Books 1994 ISBN 0 7176 0725 9.
- Control guidance sheets 101, 204, 302, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any ventilation system is switched on and is working.
- Take special care not to overfill the mixer.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



COSHH essentials:
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Mixing (liquids)

318

Containment

Control approach 3



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on mixing medium and large quantities of liquids. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

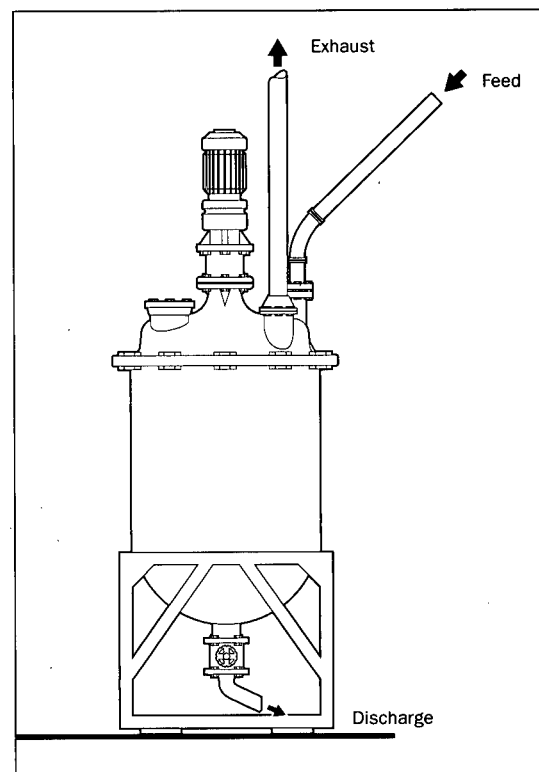
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Control staff entry to the work area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ The mixer should be fully enclosed and provided with effective seals on the lid, other access points and mixer drive shafts.
- ✓ Ensure the mixer is adequately vented to prevent pressure build-up.
- ✓ The mixer should be provided with liquid level and pressure indicators that are clearly visible.
- ✓ Consider the use of pressure relief valves and/or bursting discs for reactive materials.
- ✗ Do not allow entry to a closed mixer for cleaning or maintenance until the equipment has been isolated, made safe and the atmosphere checked for oxygen deficiency or toxic gases.
- ✓ Design the closed system to allow easy maintenance and cleaning.
- ✓ Keep the process equipment under negative pressure to prevent leakage.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.



Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order, and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.

Examination and testing

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.
- ✓ Ensure any extraction equipment is thoroughly examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the workroom regularly. Once a week is recommended.
- ✓ Deal with spills immediately. For liquids, contain or absorb using granules or mats.
- ✓ Store containers in a safe place (see CGS 101).
- ✓ Dispose of empty containers safely.
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) should not normally be needed for routine operations. It may be needed for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that all control measures are in place and being followed.

Further information

- Safety data sheets.
- *Work in confined spaces* INDG258 HSE Books 1997.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Minimise manual additions. If possible make those additions first before sealing the vessel.
- Before use, check that the seals are intact.
- Make sure any extraction system is switched on and is working.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb with granules or mats. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



COSHH essentials:
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Control approach 3

Containment

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This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on surface coating with medium and large quantities of liquids using a robotised spray booth. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

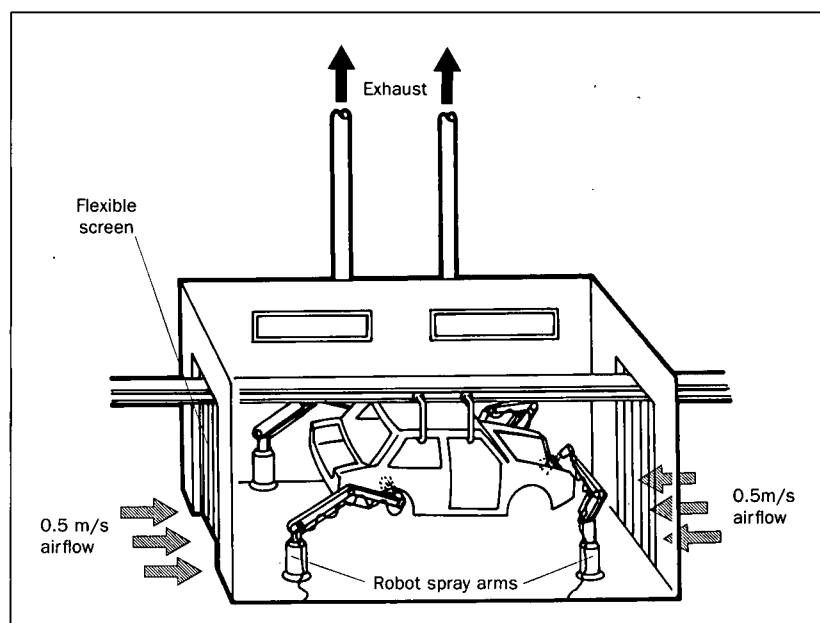
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Control staff entry to the work area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ Air flow into the booth openings should be at least 0.5 metre per second.
- ✓ Keep the open area as small as possible.
- ✓ Use filters to prevent paint deposits on electric motors, fan blades and ventilation ducts.



- ✓ Consider where sprayed items are to be located while drying. A second ventilated area may be required.
- ✓ Provide good lighting in the booth area. Select lighting equipment suitable for the nature of the substances and processes, eg flameproof.
- ✓ For flammable liquids, ensure that suitable pumps/fans are used and that appropriate earthing is undertaken.
- ✓ Design the closed system to allow easy maintenance.
- ✓ Keep the process equipment under negative pressure to prevent leaks.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order, and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.

Examination and testing

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.
- ✓ Ensure the ventilation equipment is examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the workroom regularly, once a week is recommended.
- ✓ Deal with spills immediately. For liquids, contain or absorb with granules or mats.
- ✓ Store containers in a safe place (see CGS 101).
- ✓ Dispose of empty containers safely.
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) should not normally be needed for routine operations. It may be needed for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that all control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any ventilation system is switched on and is working.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb with granules or mats. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Automated powder coating

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Containment

Control approach 3



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The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on automated power coating using medium or large quantities of solids. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

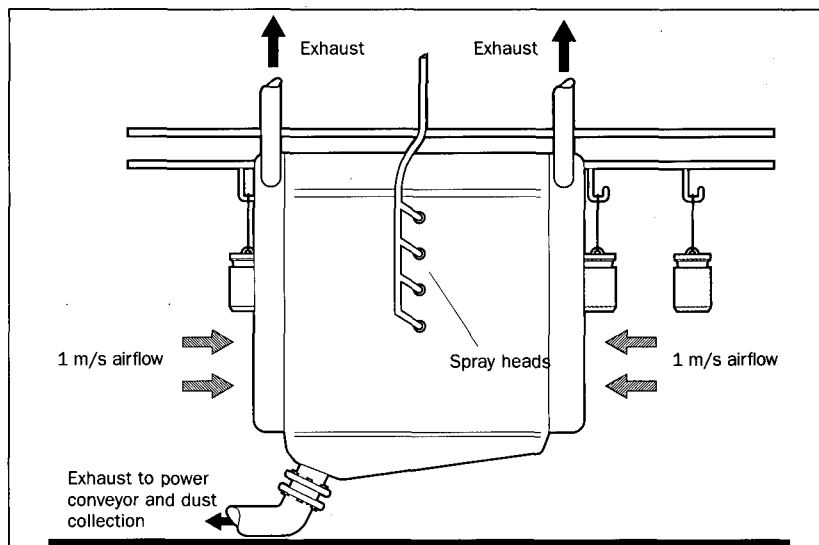
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Control staff entry to the work area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ The booth should have smooth impervious internal surfaces or other arrangements to deal with overspray, eg strippable coating.
- ✓ Adjust the application equipment to minimise powder use.
- ✓ Provide arrangements to collect and recycle excess powder.
- ✓ Air flow into any openings to the spray booth should be at least 1 metre per second.
- ✓ Use 'air curtains' at the entrance and exit to contain dust.
- ✓ Make the booth large enough to contain overspray.



- ✓ Provide interlock arrangements on access doors to shut off the conveyor and paint supply when the door is opened.
- ✓ Consider the need for explosion relief for combustible solids, and ensure equipment is appropriately earthed.
- ✓ Design the closed system to allow easy maintenance.
- ✓ Keep the process equipment under negative pressure to prevent leaks.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.

Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order, and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.

Examination and testing

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.
- ✓ Ensure the ventilation equipment is examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately. Avoid dry brushing - use a vacuum cleaner or wet mopping.
- ✓ Store packages/containers in a safe place (see CGS 101).
- ✓ Dispose of empty packages/containers safely.
- ✓ Put lids on containers immediately after use.
- ✗ Minimise the use of compressed air used in booth cleaning.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that all control measures are in place and being followed.

Further information

- Safety data sheets.
- *Safe handling of combustible dusts* HSG103 HSE Books 1994 ISBN 0 7176 0725 9.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *Control of exposure to triglycidyl isocyanurate (TGIC) in coating powders* EIS15 HSE Books 1998.
- *Code of safe practice: application of thermosetting powder coatings by electrostatic spraying* British Coatings Federation 1996.
- Control guidance sheets 101, 204, 302, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure any ventilation system is switched on and is working.
- Look for signs of damage, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. Use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Vapour degreasing bath



Control approach 3

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Containment



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The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on using vapour degreasing baths with medium or large quantities of liquids. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

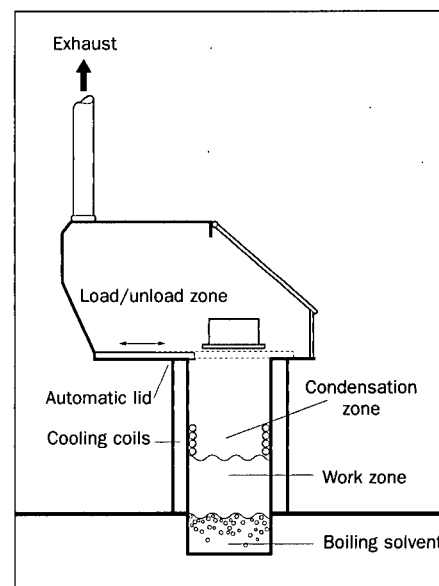
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Control staff entry to the work area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ Design the equipment to fully enclose both the bath and the loading zone.
- ✓ The freeboard height should be at least 75% of the width of the open area of the bath.
- ✓ Set the thermostat correctly and balance the heating and cooling systems so as not to overload the cooling coils.
- ✓ Provide an extraction purge to remove any excess vapour from the load/unload zone.
- ✓ Provide an internal lid to reduce vapour release into the load/unload zone.
- ✓ Consider the need for a mechanical hoist to reduce manual handling and reduce operator exposure during loading/unloading.
- ✓ Ensure employees are trained on how to safely clean and maintain the bath.
- ✓ Ensure the bath has a bottom drain to remove solvent for cleaning.
- ✓ Design the closed system to allow easy maintenance.
- ✓ Keep the process equipment under negative pressure to prevent leaks.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.



Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order, and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.

Examination and testing

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.

- ✓ Ensure the ventilation equipment is examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Deal with spills immediately. For liquids, contain or absorb spillages using granules or mats.
- ✓ Store containers in a safe place (see CGS 101).
- ✓ Dispose of empty containers safely.
- ✓ Put lids on containers immediately after use.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) should not normally be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that all control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *Health and safety at degreasing operations: sources of guidance* EIS22 HSE Books 1998.
- *Maintenance and cleaning of solvent degreasing tanks* EIS20 HSE Books 1998.
- Control guidance sheets 101, S100 and S101.

Employee checklist for making the best use of the controls

- Make sure the cooling coil and ventilation system are switched on, and are working.
- Make sure lids are shut except during loading/unloading.
- Do not overload or remove loads too quickly as this results in excessive vapour emissions.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Do not enter the bath for cleaning or maintenance without taking the precautions described in the HSE information sheet EIS20. People have died doing this job incorrectly.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb with granules or mats. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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Spray drying

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Containment

Control approach 3



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 3 - containment - as the suitable approach for your chemical(s) and task(s).

This sheet provides good practice advice on spray drying medium or large quantities of solids and liquids. It describes the key points you need to follow to reduce exposure to an adequate level.

It is important that all the points are followed.

Some chemicals can also be flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

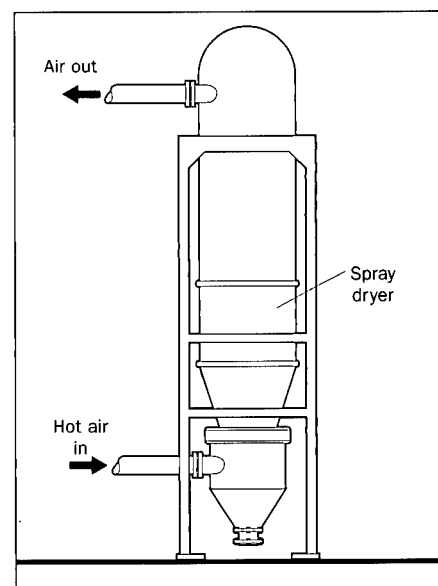
For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Access

- ✓ Control staff entry to the work area.
- ✓ The work area and equipment should be clearly labelled.

Design and equipment

- ✓ Design the feed and discharge to and from the drying chamber through pipes rather than a loading door.
- ✓ Apply good thermal insulation.
- ✓ Lights/signs should clearly indicate when the dryer is in use.
- ✓ Use a heat reclamation and air filtration system in conjunction with the dryer.
- ✓ Air throughput should be via a negative pressure fan.
- ✓ Consider the need for explosion relief for combustible solids and ensure equipment is appropriately earthed.
- ✓ Design the closed system to allow easy maintenance.
- ✓ Keep the process equipment under negative pressure to prevent leaks.
- ✓ Discharge extracted air to a safe place away from doors, windows and air inlets.



Maintenance

- ✓ Ensure all equipment used in the task is maintained as advised by the supplier/installer, in effective and efficient working order, and good repair.
- ✓ Adopt a 'permit to work' system for maintenance work.
- ✓ Follow any special procedures that are needed before the system is opened or entered, eg purging and washing.

Examination and testing

- ✓ Get information from the supplier on all parameters needed to safely operate the system.
- ✓ Visually check equipment at least once a week for signs of damage.
- ✓ Ensure the ventilation equipment is examined and tested against its performance standard. This is generally at least every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.

Cleaning and housekeeping

- ✓ Thoroughly clean work equipment and the working area daily. Clean other equipment and the workroom regularly - once a week is recommended.
- ✓ Store packages/containers in a safe place (see CGS 101).
- ✓ Dispose of empty packages/containers safely.
- ✓ Put lids on containers immediately after use.
- ✓ Deal with spills immediately.
- ✓ For solids, use a vacuum system or wet cleaning, not a dry brush or compressed air.
- ✓ For liquids, absorb or contain with granules or mats.

Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See CGS S100 and S101 for more specific advice. Check the safety data sheets to see what personal protective equipment is necessary.
- ✓ Ask your safety clothing supplier to help you select suitable protective equipment.
- ✓ Respiratory protective equipment (RPE) should not normally be necessary for routine operations. It may be necessary for some cleaning and maintenance activities, eg cleaning up spills.
- ✓ Ensure PPE is kept in a clean condition and replaced when necessary.

Training

- ✓ Give your workers information on the harmful nature of the chemicals.
- ✓ Provide them with training on: operating the process; following maintenance procedures; when and how to use PPE; and how to detect and deal with leaks.

Supervision

- ✓ Have a system to check that all control measures are in place and being followed.

Further information

- Safety data sheets.
- *Maintenance, examination and testing of local exhaust ventilation* HSG54 HSE Books 1998 ISBN 0 7176 1485 9.
- *Safe handling of combustible dusts* HSG103 HSE Books 1994 ISBN 0 7176 0725 9.
- *User guide to fire and explosion hazards in the drying of particulate materials* Institution of Chemical Engineers 1977.
- Control guidance sheets 101, 204, 302, S100 and S101.

Employee checklist for making the best use of the controls

- Before use, check that the seals are intact.
- Look for signs of leaks, wear or damage of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- Wash your hands before and after eating, drinking or using the lavatory.
- Do not use solvents to clean your skin.
- Clear up spills straight away. For liquids, contain or absorb with granules or mats. For solids, use vacuum cleaning or wet mopping. Dispose of spills safely.
- Use, maintain and store any PPE provided in accordance with instructions.



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General principles

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Special

Control approach 4



This guidance sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH), by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used where the guide recommends control approach 4 - special - as the approach needed for your chemical(s) and task(s).

Some chemicals are also flammable or corrosive. Where they are, your controls must be suitable for those hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Background

Control approach 4 - special - means you have a situation where you need more specific and specialist advice than provided by *COSHH essentials: easy steps to control chemicals*. The advice may come from a more detailed HSE guidance document, or you may need to involve an expert, such as a qualified occupational hygienist. An occupational hygienist can give you site-specific advice on your risk assessment, the possibility of substituting the chemical you are using for a less hazardous one, and control measures. It is important that you seek further advice.

COSHH essentials identifies control approach 4, if:

- you are handling chemicals assigned to hazard group E. These have the potential to cause **very serious health effects**, such as cancer or asthma, and a safe level of exposure will be difficult to establish. Different types of control will be needed for different chemicals in this group; or
- you are handling large quantities of chemicals that can easily become airborne and that cause serious health effects. All aspects of handling these substances need to be assessed in a level of detail beyond that provided by *COSHH essentials*.

Further information

- HSE may have published detailed guidance on your chemical and task. Phone the HSE Infoline on 0541 545500 to find out.
- The British Institute of Occupational Hygienists (BIOH) keep a list of qualified consultants who will be able to help. You can 'phone BIOH for more information on 01332 298087.
- Chemicals assigned the R-phrases R42, can cause asthma, HSE has published some relevant guidance *Preventing asthma at work: how to control respiratory sensitisers* L55 HSE Books 1994 ISBN 0 7176 0661 9.
- Chemicals assigned the R-phrases R45 or R49, may cause cancer and are covered by the Carcinogens Approved Code of Practice (ACOP): *General COSHH ACOP, Carcinogens ACOP and Biological agents ACOP. Control of Substances Hazardous to Health Regulations 1999. Approved Codes of Practice* L5 HSE Books 1999 ISBN 0 7176 1670 3.



COSHH essentials:
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General advice



Chemicals causing harm via skin or eye contact

S100



The guidance in this sheet is aimed at employers to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH), by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used alongside control approach 1 - 4 where the guidance allocates a chemical to hazard group S.

This sheet provides general advice on the factors you need to consider for a substance allocated to hazard group S. It describes the key points you need to follow to provide adequate control, and to help ensure exposure is reduced to an acceptable level. Other sheets in the S series provide additional help on specific issues related to substances in group S.

Some chemicals can also be flammable or corrosive. Control equipment must be suitable for these hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary for some emissions into the atmosphere.

Contact with skin and eyes

Group S covers substances that can damage the skin and/or eyes, or enter the body through the skin and cause harm. This may be in addition to causing harm by being breathed in. Contact with skin and eyes can be a particularly problematic type of exposure, and controls in addition to those in guidance sheets in the 100, 200 and 300 series may be needed.

You need to consider how group S chemicals can come into contact with the skin and eyes. This can occur:

- when the skin comes into direct contact with a liquid or solid, eg by immersion;
- when dust or vapours/spray particles settle on the skin. The dust or vapour may be generated as part of the work activity or may be incidental to it;
- by touching dirty surfaces;
- by touching or removing dirty clothing;
- by splashing or swallowing.

Once contamination has got onto the hands, it may be spread to other parts of the body by rubbing or scratching.

Control measures

If you are using a chemical in hazard group S and it is likely to get onto your worker's skin or eyes, you need to consider not using it, or replacing it with one that does not fall into group S. But remember to check any replacement substance is not in a higher inhalation hazard group.

If you can't avoid exposure this way, by substitution, you will need to reduce likely contact with the skin or eyes. There is a range of options you can use:

- Can the substance be contained more? For example, a control approach 2 solution will provide more containment and less exposure than a control approach 1 solution.
- Can you modify the process to minimise handling operations or use remote handling?
- Can you segregate clean and dirty areas, and put a barrier between them? This will help to stop the spread of contamination.
- Can you provide smooth, impermeable surfaces that are easy to clean?

Once these questions have been answered and any process modifications made, it is important that the work area is cleaned regularly, and rigorous procedures are put in place to deal with spillages. Good washing facilities also need to be provided. Workers should wash their hands before and after eating, drinking and using the lavatory.

Personal protective equipment (PPE)

In situations where contact with chemicals in hazard group S is unavoidable, the use of personal protective equipment may be appropriate. However, PPE has a number of limitations:

- it has to be selected carefully (further information on the selection of PPE is given in CGS S101);
- it may limit mobility or communication;
- its continued effectiveness depends on proper maintenance, training and adherence to good working practices.

It should only be considered if other measures are impracticable.



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Selection of personal protective equipment

Chemicals causing harm via skin or eye contact

S101



The guidance in this sheet is aimed at employers to help them comply with the

requirements of the Control of Substances Hazardous to Health Regulations 1999 (COSHH), by controlling exposure to chemicals and protecting workers' health.

The sheet is part of the HSE guidance pack *COSHH essentials: easy steps to control chemicals*. It can be used alongside control approach 1 - 4 where the guidance allocates a chemical to hazard group S.

This sheet provides advice on the selection and use of personal protective equipment (PPE). It describes the key points you need to follow to provide adequate control and to help ensure exposure is reduced to an acceptable level. Other sheets in the S series provide additional help on specific issues related to substances in group S.

Some chemicals can also be flammable or corrosive. Control equipment must be suitable for these hazards too. Look at the safety data sheet for more information.

For certain processes your local authority or the Environment Agencies will impose emission limits under the Environmental Protection Act 1990. Air cleaning equipment may therefore be necessary before discharging some emissions into the atmosphere.

Types of PPE

The information you obtained from answering the questions on sheet S100 will help you decide which parts of the body are likely to be exposed to the chemicals in hazard group S. The five types of clothing that may be required are:

- chemical protective gloves;
- coveralls;
- protective footwear;
- face or eye shields;
- respiratory protective equipment (RPE).

Your protective equipment supplier should normally be able to tell you the type of protective material to select. Not all materials give protection against all chemicals. Some chemicals pass through protective materials over a period of time. It is important that you also ask your supplier how frequently the protective equipment needs to be changed. Ensure that the equipment is changed when necessary. Remember to train your workers and make sure they follow the instructions.

General precautions

- ✓ Check protective equipment for damage both before and after use.
- ✓ Clean and maintain all personal protective equipment regularly.
- ✓ Use disposable protective equipment only once and dispose of it safely after use.
- ✓ Wash cotton type overalls on a regular basis.
- ✓ Wash overalls at work or at a specialist laundry. They should not be taken home and washed with the 'family' wash.
- ✓ Store protective clothing in a clean cupboard or locker.
- ✓ Store clean and dirty clothing separately.
- ✓ Provide a good standard of personal washing facilities.



Chemical protective gloves

- ✓ The gloves must be sufficiently robust not to tear or cut while undertaking the work activity.
- ✓ Leather or stitched working gloves are not suitable for working with chemicals.
- ✓ Make sure workers don't touch the outside of a contaminated glove with a naked hand when putting gloves on or taking gloves off.

Coveralls

- ✓ The material selected should be resistant to the penetration of liquids, dusts or granules as appropriate.
- ✓ For corrosive materials such as acids, an impervious apron gives good protection.
- ✓ Coveralls should normally be worn over boots rather than be tucked in.
- ✓ Gloves should normally be worn over the sleeves to help stop contamination getting on the inside of the PPE.

Protective footwear

- ✓ Protective footwear may be necessary for safety reasons as well as for protection against chemicals. Toe cap protection, heat protection and a metal sole plate may be needed.
- ✓ Ensure protective footwear complies with the appropriate EC Standard.
- ✓ When there is a risk of liquid coming into contact with the lower leg, wellington boots should be worn.

Eye and face protection

- ✓ When handling open containers of corrosive liquids, full-face shields should be worn.
- ✓ Chemical splash goggles may be more practicable when wearing a respirator.

Respiratory protective equipment (RPE)

- ✓ The selection and use of RPE needs careful consideration - see the HSE publication *The selection, use and maintenance of respiratory protective equipment* HSG53 HSE Books 1998 ISBN 0 7176 1537 5.



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