

DCM2

COSHH essentials: Working with dichloromethane (DCM) based products

The Control of Substances Hazardous to Health Regulations 2002 (COSHH) require employers to ensure that exposure is prevented or, where this is not reasonably practicable, adequately controlled. This guidance gives practical advice on how this can be achieved by applying the principles of good practice for the control of exposure to substances hazardous to health, as required by COSHH.

It is aimed at people whose responsibilities include the management of substances hazardous to health at work, eg occupational health specialists, anyone undertaking COSHH assessments and supervisors. It is also useful for trade union and employee safety representatives. It will help you carry out COSHH assessments, review existing assessments, deliver training and supervise activities involving substances hazardous to health.

This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory, unless specifically stated, and you are free to take other action. But if you do follow the guidance, you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance.

See Essential information near the end of this sheet.

Brushing or spraying of adhesives and paint strippers at transient workplaces

Control approach General Ventilation and Respiratory Protective Equipment (RPE)

What this sheet covers

This sheet describes good practice for the control of exposure to dichloromethane (DCM) vapour when applying DCM-based adhesives or paint strippers to workpieces, by brushing or stripping at transient workplaces. Transient workplaces are considered to be temporary and include construction and renovation sites, and domestic premises.

It covers the key points you need to follow to reduce exposure to DCM vapour to an adequate level. This is achieved by following good control practice (ie follow all points described in this sheet or use equally effective measures), and by reducing DCM exposure to below the relevant workplace exposure limit (WEL). This sheet does not cover other health and safety risks.

Main points

- ✓ DCM is a highly volatile solvent. Small volumes will readily give off large amounts of vapour, even at room temperature. DCM vapour is colourless with a low odour so you may be unaware you are at serious risk.
- ✓ DCM vapour is heavier than air and will therefore tend to accumulate at lower levels in the workplace.
- ✓ Exposure to high concentrations of DCM vapour has caused impaired consciousness and death, eg when using DCM-based adhesives to lay bathroom floor tiles.
- ✓ Avoid the use of DCM-based products whenever reasonably practicable, by using suitable and safer alternative products or methods, eg paint removal by sanding.
- ✓ **DCM-based products should ONLY be used in well ventilated areas, to prevent the build-up of vapour.** Examples of poorly ventilated areas can include bathrooms, cellars, stairwells and sheeted enclosures.
- ✓ Obtain specialist advice for selecting the right personal protective equipment (PPE). This is because DCM can penetrate through gloves and respirator filters very quickly, therefore they usually only provide protection for a very short time.
- ✓ Avoid working alone. If this cannot be avoided, ensure regular and frequent contact with someone else.
- ✓ For paint stripping at transient workplaces, only those trained and holding an official Certificate of Competence are allowed to use DCM-based paint strippers. A certificate can be obtained from the Health & Safety Executive following the successful completion of training and an online exam (see *Dichloromethane – Certificate of Competence* in Essential information).

- ✓ Seek competent specialist advice before working with DCM-based products if you are unsure how the task can be done safely.

Hazards

- ✓ Breathing in DCM vapour can affect the central nervous system, causing symptoms such as headaches, lethargy, lack of coordination, nausea and impaired consciousness (narcosis).

At high concentrations DCM can cause death.

- ✓ DCM breaks down to carbon monoxide within the body, which reduces the flow of oxygen. This may aggravate symptoms for those with heart and/or lung problems.
- ✓ DCM is suspected of causing cancer.
- ✓ DCM can be absorbed through the skin.
- ✓ DCM can burn the skin, or cause irritation leading to dermatitis.
- ✓ DCM can irritate and burn the eyes.
- ✓ The WEL for DCM is detailed in HSE publication EH40/2005 (see Essential information).

Access to work area

- ✓ Segregate the work area and ensure there is adequate ventilation. Do not work in poorly ventilated areas, eg bathrooms, cellars, stairwells or sheeted enclosures.
- ✓ Allow access to authorised and appropriately trained people only.
- ✓ Ensure the DCM vapour does not build up to create a confined space risk.

Caution: Before carrying out work in confined spaces refer to the specific guidance in HSE publication L101.

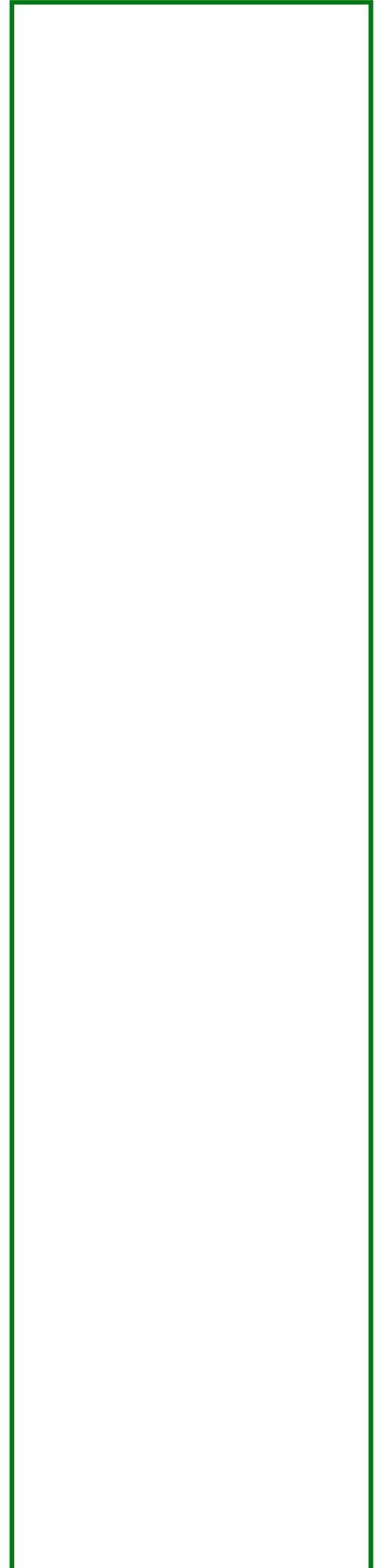
- ✓ Avoid working alone when using DCM-based products. Ensure that an appropriate monitoring and communication system is in place, eg regular and frequent visual or verbal contact or CCTV.
- ✓ For paint stripping at transient workplaces, only those trained, and holding an official Certificate of Competence are allowed to use DCM-based paint strippers. A certificate can be obtained from the Health & Safety Executive following the successful completion of training and an online exam. A certificate is not required for the use of DCM-based adhesives, although the risks are similar.
- ✓ Only allow workers to eat and drink in a designated location away from the work area.

Equipment and procedures

- ✓ Wherever possible relocate the workpiece requiring adhesion or stripping to a permanent industrial workplace, and carry out the task using effective engineering controls (see sheet DCM1 in Essential information).

Product and application

- ✓ Choose products containing as low a concentration of DCM as possible. Speak to your supplier.
- ✓ Avoid using spray products when possible.
- ✓ Select a gel-based, rather than a liquid-based, product to reduce contamination from splashes.
- ✓ Use long-handled tools (eg spatula, brush, roller, scraper) with drip guards to apply the product and remove any softened surface coatings.



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- ✓ Use the minimum amount of product, and apply over the smallest area necessary – follow manufacturer's instructions.
 - ✓ Keep containers closed when not in use to minimise the release of DCM vapour into the air. Only open containers in a well ventilated area.
 - ✓ Apply the product quickly to minimise the duration of exposure, but with precision to avoid the need to repeat the task or use more product than necessary.
 - ✓ Do not remain in the work area while the workpiece is drying.
 - ✓ Put any scraped off softened surface coatings into a sealed container for disposal as hazardous waste.
 - ✓ Avoid transferring tools, equipment or materials that are contaminated with DCM into your vehicle. If there is no alternative, then these should be contained in sealed, airtight containers suitable for the purpose.

General ventilation

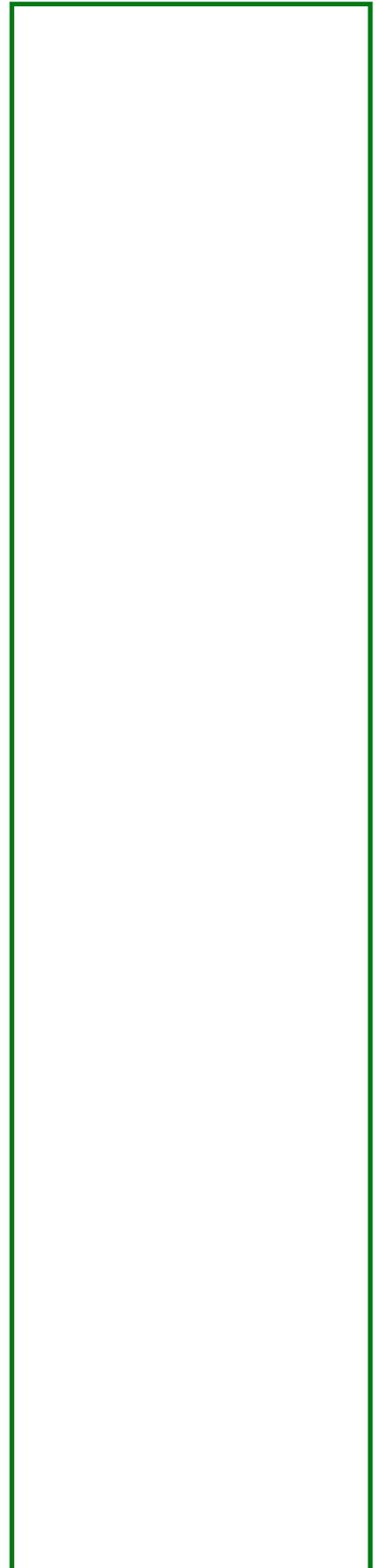
- ✓ Provide effective general ventilation to the work area to prevent the build-up of DCM vapour, by providing sufficient air movement to rapidly clear the vapour.
- ✓ In most circumstances mechanical general ventilation will be required because natural ventilation from open doors and windows is not sufficient to disperse the vapour.
- ✓ The design of the mechanical general ventilation system should use mobile fans and flexible ducting systems positioned to maximise dilution and extraction, to disperse the DCM vapour away from the worker, and discharge to a safe place eg an open window or door.
- ✓ Ensure that the general ventilation is operational during the task and while the DCM is evaporating. Do not turn the ventilation off until all the DCM vapour has been cleared.

Procedures

- ✓ Tools contaminated with DCM residues should only be cleaned in a well-ventilated work area. Doing this in a well-ventilated area outside is also an option.
- ✓ Plan how you will deal with any emergency situation such as a large spill in the workplace. See the product safety datasheet for further information.
- ✓ Any emergency procedure should cover measures to mitigate any effects (eg if a worker becomes affected by inhalation or skin/eye contact), and restore the situation to normal (eg controls needed to clean up a large spill). Refer to Public Health England document *Dichloromethane - General Information* in Essential information.

Respiratory protective equipment (RPE)

- ✓ RPE is normally needed when using DCM-based products.
- ✓ RPE is needed when cleaning equipment or cleaning up spills.
- ✓ Provide constant flow airline breathing apparatus (CFABA). This is because DCM vapour can penetrate through respirator filters very quickly, therefore they usually only provide protection for a very short time. Ensure that the CFABA provided has an assigned protection factor (APF) of at least 40 (see sheet R4 in Essential information). Always check with your equipment supplier that the RPE is suitable for use with DCM and your specific task.



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- ✓ RPE with AX filters may be adequate in certain situations, eg for very short duration tasks (a few minutes).
Caution: RPE with AX filters may fail unpredictably depending on the circumstances in which they are used. Always seek specialist advice before using this type of RPE.
 - ✓ Fit testing is required for RPE with a tight-fitting face seal.
 - ✓ Workers wearing tight-fitting RPE must be clean shaven, trained how to fit it properly and how to look after it (see HSE publication INDG479 in Essential information).
 - ✓ Carry out a visual check to confirm that all parts are present, correctly fitted and in good working order. Ensure that the pressure and volume flow rate of the air supply are adequate (see HSE publication HSG53 in Essential information).
 - ✓ Visually check the compressed airlines for signs of damage before each use.
 - ✓ Replace valves, face seals and worn or damaged parts on respirators.
 - ✓ A thorough maintenance, examination and test should be carried out at least once a month. However, if the RPE is used only occasionally, an examination and test should be carried out before use and, in any event, the interval should not exceed three months.
 - ✓ Compressed air systems used for the operation of air tools should not be used for breathing purposes **UNLESS** the air has been shown to meet the minimum quality requirements.
 - ✓ Ensure that the air supply provided to the CFABA is clean by siting it in a clean and safe location (with sufficient ventilation to ensure that emissions are displaced safely).
 - ✓ Keep the CFABA clean and store it in a clean place away from contamination.
 - ✓ Instruct workers on how to check RPE is working properly before every use.
 - ✓ HSE publication L5 details the information that should be kept in order to show the RPE is performing as originally intended – see section entitled *Suitable records*.

Personal protective equipment (PPE)

- ✓ Provide face protection, eg splash protection goggles or face visors, unless any RPE being used fulfils this role.
- ✓ Ask your supplier to advise on suitable coveralls and chemical resistant aprons.
- ✓ Ensure all PPE you provide, including suitable protective gloves, is compatible and resistant to DCM. Be aware that many common types of gloves may not provide adequate protection. Always check with your supplier (see HSE publication HSG262 in Essential information).
- ✓ Ensure workers are trained in the use of gloves, including how to take them off without contaminating themselves, and dispose of the gloves safely after single use (see HSE video *Removing single-use gloves without contaminating your hands* in Essential information).
- ✓ Make suitable arrangements for the storage and replacement of PPE. Provide separate storage for clean and contaminated PPE.

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- ✓ Coveralls and chemical resistant aprons contaminated with DCM should be stored in a ventilated area until dry.
 - ✓ Ensure contaminated overalls are laundered before re-use.
 - ✓ Use a contract laundry or a suitable equivalent to wash work clothing. Do not allow workers to launder clothing at home.
 - ✓ Inform your laundry service provider that the clothing may be contaminated with hazardous chemicals. Ensure work clothing is fully aired before collection from the workplace.

Personal decontamination and skin care

- ✓ Provide warm water, mild skin cleansers, and soft paper or fabric towels for drying. Avoid abrasive cleansers.
- ✓ Provide pre-work skin creams, which will make it easier to wash dirt from the skin.
- ✓ Provide after-work creams to replenish the natural moisture content of the skin.

Caution: 'Barrier creams' are not 'liquid gloves' and do not provide a full barrier.

Maintenance, examination and testing

- ✓ Keep all equipment used for the task in effective working order.
- ✓ Maintain it as advised by the supplier or installer.
- ✓ Check for signs of damage to control equipment before starting work.
- ✓ Establish a plan for regular preventative maintenance.
- ✓ Have equipment thoroughly examined and tested against its performance standard, at suitable intervals.
- ✓ Keep records of all examinations for at least 5 years.

Cleaning and housekeeping

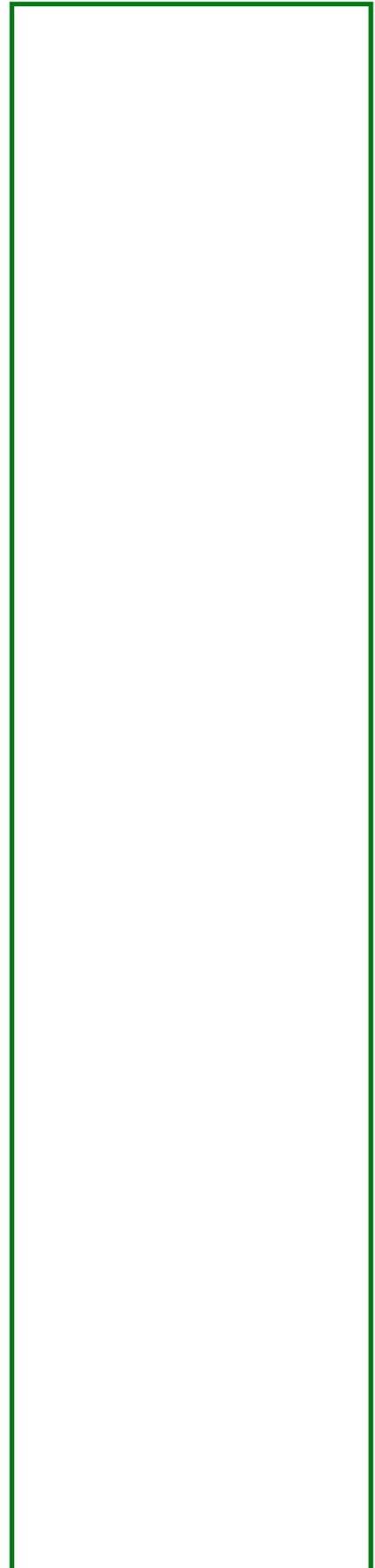
- ✓ Clean work equipment and the work area daily or at the end of the job.
- ✓ Always use RPE and PPE when dealing with any spills of adhesives or stripping solution.
- ✓ Deal with any spills immediately.
- ✓ Dispose of hazardous waste and empty containers safely.

Health surveillance

- ✓ Provide your employees with health surveillance for dermatitis where there is a reasonable likelihood that it may occur in your workplace (see sheet G403 in Essential information).

Training and supervision

- ✓ Tell workers about the hazards associated with their work and how to prevent and recognise early signs of narcosis and dermatitis.
- ✓ Tell workers who to report any such signs to.
- ✓ Provide workers with training on:
 - working safely with hazardous substances;
 - when and how to use controls, including positioning of fans and how to put on and take off gloves correctly;
 - how to check they are working;
 - how to use RPE;



- how to check that the RPE is working; and
 - what to do if something goes wrong.
- ✓ Provide supervision – ensure that safe work procedures are followed.
 - ✓ Involve managers and supervisors in health and safety training.
 - ✓ Training records are helpful to demonstrate what information, instruction and training has been provided.
 - ✓ Any professional workers using DCM-based paint strippers (but not DCM-based adhesives) at transient workplaces must hold official Certificates of Competence issued by the Health & Safety Executive.

Essential information

Dichloromethane - Certificate of Competence website
<https://dcm.hsl.gov.uk/>

Brushing or spraying of paint strippers and adhesives at permanent industrial premises COSHH essentials guidance sheet DCM1
<https://www.hse.gov.uk/coshh/essentials/direct-advice/index.htm>

Health surveillance for occupational dermatitis COSHH essentials guidance sheet G403 HSE www.hse.gov.uk/pubns/guidance/g403.pdf

UK Standard Assigned Protection Factor 40 (APF 40)
COSHH essentials guidance sheet R4 HSE
www.hse.gov.uk/pubns/guidance/rpe4.pdf

Control of substances hazardous to health: The Control of Substances Hazardous to Health Regulations 2002. Approved Code of Practice and guidance L5 (Sixth edition) HSE 2013
<https://www.hse.gov.uk/pubns/books/l5.htm>

Safe Work in Confined Spaces Confined Spaces Regulations 1997 Approved Code of Practice and guidance L101 (Third edition) HSE 2014 www.hse.gov.uk/pubns/books/l101.htm

Respiratory protective equipment at work: A practical guide HSG53 (Fourth edition) HSE 2013 www.hse.gov.uk/pubns/books/hsg53.htm

Managing skin exposure risks at work HSG262 (Second edition)
HSE 2015 www.hse.gov.uk/pubns/books/hsg262.htm

EH40/2005 Workplace exposure limits HSE 2020 www.hse.gov.uk/pubns/books/eh40.htm

Guidance on respiratory protective equipment (RPE) fit testing Leaflet INDG479(rev1) HSE 2019 www.hse.gov.uk/pubns/indg479.htm

Further information

You can find the full COSHH essentials series at
www.hse.gov.uk/coshh/essentials/index.htm

Removing single-use gloves without contaminating your hands
Video HSE www.hse.gov.uk/skin/videos/gloves/index.htm

Personal protective equipment at Work L25 (Third edition) HSE 2015
www.hse.gov.uk/pubns/books/l25.htm

Confined spaces: A brief guide to working safely Leaflet INDG258(rev1) HSE 2013 www.hse.gov.uk/pubns/indg258.htm

Restriction on use of Dichloromethane Annex VII to REACH – Conditions of restriction. Entry 59. From European Chemicals Agency

(ECHA). <https://echa.europa.eu/documents/10162/0ea58491-bb76-4a47-b1d2-36faa1e0f290>

The REACH Enforcement (Amendment) regulations 2014. SI 2014/2882. <https://www.legislation.gov.uk/ukxi/2014/2882/regulation/2>

British Occupational Hygiene Society (BOHS) Directory of Occupational Hygiene Services <https://www.bohs.org/information-guidance/>

Dichloromethane. General information. Public Health England document 2017 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/614328/Dichloromethane_general_information.pdf

For information about health and safety visit <https://books.hse.gov.uk> or <http://www.hse.gov.uk>

You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

To report inconsistencies or inaccuracies in this guidance email: commissioning@wlt.com

Employee checklist

- Do you understand the health hazards associated with your work?
- Are you sure about safe work procedures?
- Are you sure how to use all controls?
- Check that any RPE works properly every time you use it.
- Check for signs of leaks, wear and damage to RPE before every job.
- If you find any problems, tell your supervisor, don't just carry on working.
- Co-operate with health surveillance.
- Use, maintain and store your PPE in accordance with the relevant instructions.
- Do not use gloves that are punctured, split, cracked, or damaged in any way.
- Wash your hands before eating, drinking, smoking, using the lavatory and after work.
- Follow any skin care programme provided.