

**Dubai Municipality
Health and Safety Department**

**Technical Guidelines for
Safe Use of Industrial Organic Solvents**

DM-HSD-GU43-SUOS2



GOVERNMENT OF DUBAI

Organization Unit:	Health & Safety Department	الوحدة التنظيمية:
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Introduction:

The use of organic solvents is extremely widespread in industrial operations and formulations such as paints and lacquers, adhesives, degreasing, dry cleaning, printing etc. Solvents exposures may occur in processing, manufacture, formulation or use of products and substances. While the degree of hazard may vary, all solvents should be considered potentially hazardous and due care taken in their use. Dubai Occupational Health and Safety Regulations require the employers to ensure a safe work area by taking adequate safety precautions in industrial activities.

Guidelines:

1. Identification

All organic solvents or chemicals shall be labeled according to their class of risk by affixing an approved class label and an approved subsidiary risk label for any secondary risks.

- Before handling organic solvents, reference should be made to the current Material Safety Data Sheet (MSDS), which should be obtained from the manufacturer or supplier.
- If the company is importing organic solvents or chemicals or other dangerous goods, a Material Safety Data Sheets shall be obtained from the supplier.
- A person or company using or storing organic solvents or dangerous goods shall ensure that an appropriate Material Safety Data Sheet is available for each material for reference and inspection by Inspectors/Officers from Dubai Municipality.

2. Prevention and Control Measures:

- Work area sampling and analysis should be undertaken at regular intervals by competent persons to ensure that exposure standards are not exceeded.
- In addition to monitoring of the work area and personal monitoring at each work location, biological monitoring of the worker should be done for workers with a substantial risk of exposure.
- Employees engaged in the manufacture, formulation, handling or use of organic solvents shall be medically examined at least once in every 12 calendar months in accordance with tests prescribed by the Medical Officer with particular reference to the nature of the individual exposure.



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2.1 Exposure Standards

- Worker exposure to organic solvents should be kept as low as practicable. Every attempt should be made to keep exposure well below the exposure standards in “Threshold Limit Values for Chemical Substances in the Work area” adopted by ACGIH, followed in the Health and Safety Department Standards for the Emirate of Dubai.
- When the body is exposed to two or more solvents, the effect of different hazards may be either additive or a combination that exceed the sum of individual effects. Assessment of exposure must consider total solvent exposure.

2.2 Control Measures

- Whenever practicable, a substance that gives rise to harmful atmospheric contaminants should be eliminated or replaced by one that is harmless or less harmful than the offending substances.
- A less hazardous method of performing a task or modify the original process so that they are less dangerous. Where possible, aqueous (water-based) solvents should be substituted for organic solvents.
- Where practicable, the use of mechanical handling methods should be used to avoid exposure of workers.
- Hazardous atmospheric contaminants should be effectively controlled at their source by means of a local exhaust system.
- The design of effective ventilation system should also consider combustible, flammable or potentially explosive nature of materials handled.
- Air from local exhaust ventilation system should not be re-circulated into the workroom.
- Air conditioning inlets or compressors supplying air should be distant from the exhaust ventilation systems.
- General ventilation and dilution ventilation are not as effective as local exhaust ventilation for the control of atmospheric contaminants. They may be useful to control minor contaminant emissions of low toxicity.
- Hazardous process should be isolated so as to reduce to a minimum the number of employees potentially liable to be exposed to the contaminant.
- Where practicable, the substances to be utilized or produced should be totally enclosed with proper exhaust arrangements to prevent personal contact with the substances and also prevent any release of contaminants into the air of the workshop. E.g. provision of exhaust and lid arrangements on degreasing plant operations.



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2.3 Personal Actions

The following personal actions should be adopted:

- Avoid contact the dangerous good with skin and inhalation of vapor.
- Do not enter confined spaces where vapour may have collected and follow confined space entry procedures.
- Do not lean over vessels containing liquid.
- Do not assume an empty vessel is safe.
- Do not eat, drink or smoke in the workplace.
- Wash hands prior to eating or drinking.
- Any spills should be cleaned up promptly. Follow Material Safety Data Sheets spillage mitigation procedures.
- Employees should have ready access to clean work clothes, protective clothing, adequate washing, showers and change rooms.
- Splashes by irritant or sensitizing substances must be washed off immediately with soap and water.
- Contaminated clothing must be removed.

2.4 Personal Protective Equipment:

- Personal protection should be a supplement to other preventive action. It should not be regarded as a substitute for control measures.
- Personal protective equipment must be appropriately selected, checked periodically and workers trained in their correct use and maintenance.
- Where elimination, substitution and engineering controls are not feasible or do not reduce the atmospheric concentration to acceptable levels as per exposure standards, suitable respiratory protective devices for the nature and type of work, should be provided and used.
- Solvent resistant gloves conforming to International standards, for example PVC gloves with coverall or overall, solvent resistant boots and apron should always be worn. The type of gloves chosen need to be effective against the specific solvent being used.
- The use of organic solvents, such as kerosene, gasoline, thinners to remove materials - paints, grease or oil from the skin should be prohibited. This practice can cause dermatitis and add to the total body exposure to solvents.
- Safety glasses, goggles or face shields should be worn when organic solvents are being used/handled.



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2.5 Storage

The Code of Practice for the Management of Dangerous Goods in the Emirate of Dubai should be followed strictly. The following points should be noted:

- Solvents should be stored in a cool place, away from any potential ignition sources.
- The storage area should be well ventilated to prevent the build-up of solvent vapor.
- Storage area should be isolated from the workplace and firmly secured.
- Amounts stored should be regularly monitored and kept to a minimum.
- Appropriate bonding should be used wherever necessary.
- Solvents should be stored away from food, drink and therapeutic substances.
- The storage area should be equipped with appropriate firefighting devices.
- The storage area should be readily accessible to emergency vehicles and personnel.
- Smoking must be prohibited in and around storage areas.
- Organic solvents should be stored separately from other classes of chemicals.
- Organic solvents shall be segregated in storage according to their dangerous goods class as required under the Code of Practice on the Management of Dangerous Goods in the Emirate of Dubai.

2.6 Notices and Labels

- Containers should be clearly labeled to show the chemical contents, hazards and storage precautions. Reference should be made to Material Safety Data Sheet (MSDS).
- Areas where organic solvents are stored should be placarded with “Flammable Material”, “No Smoking”.
- Tanks, pipelines and supply valves should be labeled clearly.
- Containers for storage and transport should bear hazard warning labels to include hazardous nature of the substance and procedures to be adopted in case of emergency.
- The design of warning labels should consider languages and the illiterate pictorial warning in addition to written information should be provided.

2.7 Education and Training

- All employees working with organic solvents must be informed of the hazards from exposure to the contaminants and the precautions necessary to prevent damage to their health.
- Employees should be trained in appropriate procedures to ensure that they carry out their work safe guarding against the exposure to themselves and fellow workers.



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2.8 Transportation

Transport of organic solvents should be as per the specifications adopted by International Standards for packages, containers and vehicles and appropriate hazard warning labels for the solvent.

2.9 Spills and Leaks

In case of spills or leaks:

- Where safe to do so, close off the source of the spill or leak, taking appropriate precautions to avoid exposure.
- Confine the spill or leak; cordon off the area or isolate the ventilation.
- Avoid inhalation of vapor and contact with skin and eyes.
- Wear appropriate personal protective equipment.
- Do not allow smoking, naked lights or ignition sources.
- Transfer the material from damaged to other containers or remove as appropriate.
- Absorb or contain spill or leak residues with sand, earth or some other appropriate absorbent.
- Do not allow the spillage to enter drains or sewers.
- Depending on the size and location of the spill, notify the Civil Defence fire Bridge, Police and /or Emergency contact.
- Refer to the Material Safety Data Sheet (MSDS) for any specific instructions, including disposal procedures.
- Contact the Health and Safety Department to ensure about the necessary actions.

2.10 Fire and Explosion Hazards

1. The flammable and explosive risk should be determined by examination of:
 - Flash point
 - Explosive or flammability limits
 - Auto ignition temperature.
2. While handling organic solvents in addition to elimination of common sources of ignition such as spark, naked flame, heat/temperature, friction etc., spark due to static charge should be eliminated by earthing/bonding systems.
3. In case of fire:
 - Wear self-contained positive pressure breathing apparatus.
 - Avoid skin contact



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- Keep containers cool with water spray to prevent radiant heat/ expansion/rupture.

4. Refer to MSDS for extinguishing media allowed for the particular solvent.

2.11 First-aid:

- Safety showers and eye wash stations must be available at workplace where there is significant use/storage of organic solvents.
- First-aid procedures for specific solvents used in workplaces should also be available.
- Reference should be made to the MSDS.
- In case of splash on skin/clothing remove the contaminated clothing and shoes. Wash skin with soap and water. Seek medical attention.
- In case of splash on eyes, wash the eyes immediately and thoroughly with copious amounts of clean water. Seek medical attention.
- In case of inhalation of vapours, remove the patient to fresh air. If breathing has stopped, administer artificial respiration. Transfer to a hospital immediately by ambulance.
- In case of ingestion, seek medical advice. Do not induce vomiting as it may be harmful with certain solvents. Reference should be made to the MSDS.

References:

American Conference of Governmental Industrial Hygienists - Threshold Limit Values for Chemical Substance in the Work Environment.

For any further information, please contact:

Health and Safety Department

Dubai Municipality

Tel: 800900

Safety@dm.gov.ae