Flammable and Combustible Liquids: Storage and Handling Procedure

Section 1 - Purpose and Scope

(1) This Procedure outlines requirements for the storage and handling of flammable and combustible liquids at The University of Queensland (UQ) and applies to all UQ workers that store or handle flammable and combustible liquids at UQ.

(2) For the purposes of this Procedure, the definition of UQ workers is broad – including staff, students, visitors, volunteers and contractors – and is intended to ensure UQ meets its responsibilities under the Work Health and Safety Act 2011. The definition of UQ workers is provided in the Appendix.

(3) This Procedure supports UQ's Health, Safety and Wellness Policy and should be read in conjunction with relevant procedures and guidelines related to occupational hygiene and chemical safety.

Context

(4) The storage and handling of flammable and combustible liquids is governed by the Work Health and Safety Act 2011 and the Work Health and Safety Regulation 2011. Workplace Health and Safety Queensland's Guide for Flammable and Combustible Liquids outlines the regulatory requirements for storage and handling of flammable and combustible liquids under the legislation and its relationship with other classification systems.

(5) Various Australian Standards (Standards) apply to the storage and handling of flammable and combustible liquids. Standards are published documents that are designed to provide guidance and help ensure safety, performance and reliability of systems. The following Standards guide safe work practices and procedures in relation to the storage and handling of flammable and combustible liquids at UQ:

a. AS 1940-2017 The storage and handling of flammable and combustible liquids.
b. AS/NZS 2243.10-2004 Safety in laboratories – Storage of chemicals.
c. AS/NZS 60079.10.1:2009 Explosive atmospheres – Classification of areas – Explosive gas atmospheres.
d. AS/NZS 60079.10.2:2011 Explosive atmospheres – Classification of areas – Combustible dust atmospheres.

(6) Copies of the Standards are available to UQ workers online via the UQ Library. See Health, Safety and Wellness Division website for additional information.

Section 2 - Process and Key Controls

(7) The following requirements apply to storage and handling of flammable and combustible liquids at UQ.

a. Risk and Hazard Zone Assessment:
    i. Before using a flammable or combustible liquid, UQ workers must assess the risk of its intended use, based on the liquid's Safety Data Sheet.
    ii. Where the creation of a hazardous atmosphere is expected from the use of flammable liquids, a

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competent person that holds a current ‘Hazardous Area Classifier’ certificate must undertake a hazard zone assessment of the work area (see ‘Risk and Hazardous Zone Assessment’ provisions below.).

b. Containers of flammable and combustible liquids must be labelled correctly in accordance with the Globally Harmonised System of Classification and Labelling of Chemicals (GHS).
c. Flammable and combustible liquids that exceed minor quantity limits (as prescribed in ‘Storage and Permissible Quantities’ provisions below) must be stored in an approved flammable liquids cabinet. Supervisors and Managers must ensure that storage quantity limits are adhered to and that flammable liquids cabinets are correctly rated with appropriate external signage.
d. Organisational Units that use flammable and combustible liquids must implement safe work instructions or standard operating procedures that have been developed based on AS 1940-2017 The storage and handling of flammable and combustible liquids. Higher risk areas including Property and Facilities Division petrol stations at the St Lucia and Gatton campuses must ensure risk assessments and standard operating procedures are implemented at the operational level.
e. All waste flammable and combustible liquids must be disposed of in accordance with UQ’s Chemical Waste Operating Procedure.

Section 3 - Key Requirements

Risk and Hazardous Zone Assessment

(8) Before using a flammable or combustible liquid, UQ workers must assess the occupational health and safety risks of its intended use and storage through the risk assessment process and based on the Safety Data Sheet (refer to the Health and Safety Risk Assessment Procedure) to determine whether a hazardous atmosphere is expected to be present (hazardous atmosphere is defined in the WHS Regulation and outlined in the appendix).

(9) If the risk assessment indicates that a hazardous atmosphere is expected to be present from the use of flammable liquids (or its gases or dusts) and it cannot be eliminated (either through redesigning work practices or operations), then a formal hazardous zone assessment and classification must be undertaken. This is to be completed by a person that holds a current ‘Hazardous Area Classifier’ certificate and in accordance with the following standards:

a. AS/NZS 60079.10.1:2009 Explosive atmospheres – Classification of areas – Explosive gas atmospheres; and
b. AS/NZS 60079.10.2:2011 Explosive atmospheres – Classification of areas – Combustible dust atmospheres.

(10) Further information on OHS risk assessments and hazardous zone assessments (including contact details for certified Hazardous Area Classifiers) is available from the Health, Safety and Wellness Division website.

Labelling

(11) All containers of flammable and combustible liquids at UQ must:

a. be labelled in accordance with the Globally Harmonised System for the Classification and Labelling of Chemicals (GHS); and
b. have a current Safety Data Sheet that reflects GHS information.

(12) The Labelling of Workplace Hazardous Chemicals Code of Practice 2021 supports these requirements and provides practical guidance to assist UQ workers meet their compliance obligations.

Storage and Permissible Quantities

(13) Organisational Units must develop safe work instructions or standard operating procedures, with reference to

AS/NZS 2243.10:2004 Safety in laboratories – Storage of chemicals and AS 1940:2017 – The storage and handling of flammable and combustible liquids, including information to UQ workers addressing the following matters:

a. maintaining adequate facilities and equipment for safe storage and handling, including a fire extinguisher suitable for class B fires (dry chemical or carbon dioxide) where the quantities of flammable liquids stored are greater than 100 litres;
b. avoiding concentrated storage of liquids in one area to reduce the fire load;
c. ventilating storage areas adequately to avoid the build-up of flammable vapours;
d. segregating materials that interact dangerously with flammable and combustible liquids (e.g. oxidising agents); and
e. storing flammable and combustible liquids:
    i. in minor quantities where possible (refer to 'Flammable Liquids Cabinets' provisions below);
    ii. away from ignition sources (e.g. flames, electrical equipment, grinding and cutting operations) and excessively hot areas; and
    iii. where they will not prevent escape from a room or building in the event of a fire.

Flammable Liquids Cabinets

(14) Limited minor quantities of flammable and combustible liquids may be stored on open shelves or work benches. The following minor quantity limits apply at UQ:

a. Offices: 5 Litres per floor or level.
b. Laboratories: 10 Litres per 50m2 floor area.
c. Workshops: 100 Litres.

(15) Quantities of flammable and combustible liquids that exceed these minor quantity limits must be stored in an approved flammable liquids cabinet.

(16) The maximum quantity that may be stored in:

a. a single flammable liquids cabinet is 100 litres; or
b. aggregated flammable liquids or solids cabinets is 250 litres or 250kg, calculated within a radius of 10m from any single cabinet (including horizontally through intervening walls).

(17) Supervisors and Managers must ensure that storage limits are adhered to and that flammable liquid cabinets are correctly rated with appropriate external signage.

(18) Organisational Units that use large volumes of flammable liquids may require a purpose-built 500 litre store or arrange for more frequent deliveries of smaller quantities. Advice about acquiring a flammable liquids cabinet is available from the Work Health and Safety Coordinators or the Health, Safety and Wellness Division.

Safe Usage

(19) Organisational Units that use flammable and combustible liquids must comply with the requirements set out in this Procedure and adhere to any additional safe working procedures outlined in AS 1940:2017 – The storage and handling of flammable and combustible liquids. The minimum safe working procedures for storage and use of minor quantities of flammable and combustible liquids are prescribed in the Standard and include information about:

a. storage – away from ignition sources, storage limits, appropriate storage vessels, storage segregation;
b. spill kits and containment;

c. firefighting equipment;
d. decanting and use in an appropriately ventilated and earthed area (where required);
e. disposal; and
f. training and procedures for use.

Waste

(20) The storage and permissible quantities requirements set out in this Procedure ('Storage and Permissible Quantities' provisions, clauses 13-18) apply to waste flammable and combustible liquids.

(21) UQ workers must ensure prompt disposal of combustible waste and residue and its segregation from areas where flammable or combustible liquids are stored or decanted.

(22) More information about the collection and disposal of chemical waste at UQ is provided in the Chemical Waste Operating Procedure.

Section 4 - Roles, Responsibilities and Accountabilities

UQ Workers

(23) UQ workers that work with flammable and combustible liquids at UQ are required to comply with this Procedure, including:

a. assessing the occupational health and safety risks of using a flammable or combustible liquid in the workplace prior to use through completing risk assessments;
b. ensuring the safe and correct labelling of flammable and combustible liquids;
c. adhering to operational level safe work instructions and operating procedures regarding the storage and safe use of flammable and combustible liquids; and
d. reporting significant spills of flammable and combustible liquids in UQSafe Incident.

Supervisors and Managers

(24) Supervisors and Managers of work groups that undertake work with flammable and combustible liquids at UQ must ensure:

a. safe work instructions or standard operating procedures are developed and made available to UQ workers, where required under this Procedure (for example, in relation to the storage and safe use of flammable and combustible liquids);
b. UQ workers adhere to these procedures;
c. sufficient resources are available to enable compliance with the requirements of this Procedure (for example, the availability of suitable storage facilities); and
d. significant spills of flammable and combustible liquids are cleaned up and reported by UQ workers in UQSafe Incident.

Health, Safety and Wellness Division

(25) Health, Safety and Wellness Division in conjunction with any Health, Safety and Wellness staff, is responsible for:

a. providing UQ workers with education, advice and support regarding the safe storage and handling of flammable

and combustible liquids at UQ; and

b. assessing whether Organisational Units and UQ workers are able to demonstrate compliance with this Procedure and that any compliance issues that are identified are rectified in a timely manner.

Section 5 - Monitoring, Review and Assurance

(26) The Health, Safety and Wellness Division is responsible for reviewing this Procedure as required to ensure that it remains accurate and relevant to the needs of UQ.

Section 6 - Recording and Reporting

(27) UQ workers must report significant spills (those leading to a risk to health and safety), fires caused by spills, or spills into the environment in UQSafe Incident. The Director, Health Safety and Wellness is responsible for reporting any notifiable matters to the Workplace Health and Safety regulator.

(28) Some flammable compounds will have additional requirements for acquiring, licencing, storing, recording, reporting and logging. Examples include (but are not limited to):

a. restricted and prohibited carcinogens (e.g. Benzene requires a restricted carcinogens licence; refer to Carcinogen Use, Handling and Storage Procedure);
b. nitromethane (additional storage and logging requirements as a chemical of security concern); and
c. pyridine (requirement under the Drugs Misuse Regulation 1987 for an end user declaration to be sent to Queensland Police by the supplier).

(29) UQ workers should contact their Work Health and Safety Coordinators or Health, Safety and Wellness Manager in the first instance, or the Health, Safety and Wellness Division, to determine any additional obligations.

Section 7 - Appendix

Classifications of Flammable and Combustible Liquids

(30) The classes of liquid covered by this Procedure are principally defined in terms of their flash point with some exceptions being provided for potable and viscous liquids. The 'flash point' of a liquid is the lowest temperature of the liquid at which the vapour above it can be ignited by an ignition source.

Flammable Liquids

Packaging group I and II	liquids with a flash point <23°C (e.g. acetone, diethyl ether, ethanol, ethyl acetate, petrol, toluene).
Packaging group III	liquids with a flash point ≥23°C and ≤61°C (e.g. n-butanol, kerosene, mineral turpentine, xylene).

Combustible Liquids

Class C1	liquids with a flash point >61°C and ≤150°C (e.g. distillate, ethylene glycol).
Class C2	liquids with a flash point >150°C (e.g. cooking oil, glycerol, lubricating and hydraulic oils).

Definitions

Term	Definition
AS	Australian Standards.
AS/NZS	Australian/New Zealand Standards.
Globally Harmonised System (GHS)	Used internationally to standardise and harmonise the classification and labelling of chemicals.
Hazardous atmosphere	The WHS Regulation defines existence of a hazardous atmosphere if: - the atmosphere does not have a safe oxygen level; or - the concentration of oxygen in the atmosphere increases the fire risk; or - the concentration of flammable gas, vapour, mist or fumes exceeds 5% of the lower explosive limit for the gas, vapour, mist or fumes; or - a hazardous chemical in the form of a combustible dust is present in a quantity and form that would result in a hazardous area.
Organisational Unit	A formal grouping of staff established to conduct a discrete set of activities within a functional area of UQ.
Safety Data Sheet (SDS)	An important information source for eliminating or minimising the risks associated with the use of hazardous chemicals (hazardous substances and/or dangerous goods) in workplaces.
UQ workers	For the purposes of this Procedure includes: - staff - continuing, fixed-term, research (contingent funded) and casual staff; - contractors, subcontractors and consultants; - visiting academics and researchers; - affiliates - academic title holders, visiting academics, Emeritus Professors, Adjunct and Honorary title holders, Industry Fellows and conjoint appointments; - Higher Degree by Research students; and - volunteers and students undertaking work experience.

Contacts

(31) Relevant contacts include:

a. Occupational Hygiene Advisors: hsw@uq.edu.au
b. UQ Science Store:
    i. Phone: (07) 336 52345
    ii. Email: uqsciencestore@uq.edu.au.

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