

Ming Chi University of
Technology

Regulation No.

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<p>Regulations for Laboratory Management</p>
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Amended by the Labor Safety and Health & Toxic Chemical Substance Handling
Management Committee on 2022.03.01.

Chapter I General Provisions

Article 1 Objective/Purpose

The “Regulations for Laboratory Management” (hereinafter called these “Regulations”) is established to provide a dependable reference for the laboratories of all MCUT units to optimize laboratory management and thereby ensure the sound management of personnel, equipment, and chemicals in accordance with the *Government Procurement Act*, *Basic Environment Act*, *Occupational Safety and Health Act*, and *Fire Services Act* and with reference to the *Building Technical Regulations*; the “Regulations for Materials Management: Procurement Operation,” “Regulations for Fixed Assets Management,” and “Regulations for Construction Management” of Formosa Plastic Group; and the regulations in relation to environmental protection and occupational safety and health of MCUT.

Article 2 Scope

These Regulations shall apply to the laboratories, project research laboratories, and internship factories (shops) (hereinafter referred to as the “Lab”) of all MCUT units, including A. access control; B. outsourcing, procurement, and use of chemicals, machinery, equipment, instruments, and facilities; C. The Lab safety and health management; D. The Lab pollution (contamination) control; and E. The Lab data maintenance.

Article 3 Roles and responsibilities

1. The Lab Manager: To be appointed by the unit director based on expertise, frequency of use, health condition, and The Lab characteristics to administer the (1) access control; (2) outsourcing, procurement, and use of chemicals, machinery, equipment, instruments, and facilities; (3) The Lab safety and health management; (4) The Lab pollution (contamination) control; (5) The Lab data maintenance; and (6) other requirements set by the competent authorities, by law, and by the unit director.

2. The Lab Chemical Administrator: Take charge of the purchase requisition, inventory, and stock management of chemicals in the Lab.
3. Unit Director: The unit director under these Regulations means the department chairpersons and office deans and directors. A unit director shall supervise and check if the Lab manager unfaithfully implement The Lab management. The dean of all colleges shall also be responsible for supervising laboratories within the respective colleges.
4. Office of General Affairs: Assist in outsourcing renovation projects and purchasing machinery, equipment and instrument, and chemicals of laboratories.
5. Office of Library and Information Services: Assist in the maintenance, education, and training of the toxic chemical substances management system and campus hazardous waste management system.
6. Office of Environmental Protection and Occupational Safety and Hygiene: Plan the Lab management and audit the performance in environmental protection and occupational safety and health of all MCUT laboratories.

Chapter II Access Control Management

Article 4 Scope

This chapter is specifically established to maintain the safety of all laboratories and provide a dependable reference for The Lab management and shall apply to all academic and non-academic staff, students, research assistants, and other third parties (contractors and visitors) accessing any MCUT laboratories.

Article 5 Management Responsibility

The division of responsibility of The Lab access control is as follows:

1. Unit directors shall appoint the Lab managers to manage and maintain the access control of each The Lab. The Lab managers shall take charge of The Lab access control, check the control condition and security maintenance, and properly close and lock the Lab door after use.
2. Each department (institute) shall ensure the proper management of laboratories within its jurisdiction and inspect the condition of the Lab use. Irregular patrol shall

be arranged as necessary.

3. Unit directors shall supervise the Lab access control at ordinary times.

Article 6 Personnel Access Control

1. Lock-protected control: The key of lock-protected laboratories shall be kept by the department/institute office and the Lab manager.
2. Keycard access control: Unit directors shall appoint special staff to set the access privilege of personnel for keycard-controlled laboratories.
3. The Lab booking: When it is necessary to use a The Lab for project or research needs, students (including graduate students) shall fill in the “Application for Experiment and Research” (Form: A090050110) in accordance with the “Regulations for The Lab Management” or file an application over the Application for The Lab Research information system. After the advisor (supervisor) notifies applicants of the safety and protection requirements, the advisor, the Lab manager, and department chair shall approve the application. Applicants shall also sign the “Statement of Non-Reproduction of The Lab Key” (Form: A090050210) and “Statement of Compliance with the Rules for The Lab Management” (Form: A090050310) and apply for The Lab key reproduction to the Lab management. Applicants shall return the Lab key after use. Violation of this shall be disciplined according to the University Rules.
4. The Lab access control: When it is necessary to use a The Lab after 18:00 for product or research needs, students (including graduate students) shall fill in “Application for Evening and Holiday Experiment and Research” (Form: A090050409) or fill an application over the Application for Evening and Holiday the Lab Research information system. Students (including graduate students) shall only use the Lab for projects and research in the evening or on holidays after the application is approved. Students (including graduate students) shall also comply with all rules for Laboratory management. Violation of this shall be disciplined according to the University Rules.
5. Audit control and anomaly handling of The Lab:

- (1) When detecting unauthorized personnel entering the Lab during the Lab inspection, the Lab managers or unit directors shall check the identity of these personnel and their reasons for entry. The Lab managers or unit directors shall also check in detail if there are anomalies of the Lab equipment, chemicals, or facilities and report to the unit director for any anomalies found to seek assistance.
- (2) During the evening and holiday patrol, security guards shall patrol all department venues according to the planned routes and frequencies. After detecting anomalies, security guards shall maintain a record and deliver it to the department chair for audit to ensure that all venues and department venues are good to use.
- (3) In the event of emergency, academic and non-academic staff of all units shall immediately notify the relevant units and directors to take action on-site.
- (4) Unit directors shall appoint special personnel to crosscheck each week the department access control record provided by the Office of General Affairs. When unauthorized the Lab access or the Lab access not according to the schedule is detected, these personnel shall request students give explanations to such act and report to the supervisor to discipline such students based on the severity of offense.
- (5) Each week the Office of General Affairs shall print the list of people accessing a The Lab for over three times of each department and request each department to explain the need of the Lab use and submit the relevant applications for audit so as to ensure the enforcement of various the Lab controls.
- (6) When handing over the duty, apart from handing over the List of The Lab Property and the Lab key to the new Lab manager, the resigning Lab manager shall notify the new Lab manager of the characteristics of the Lab, these Regulations, and the relevant points for notification.

Chapter III Outsourcing, Procurement, and Use of Chemicals, Machinery, Equipment, Instruments, and Facilities

Article 7 Procurement of Chemicals

1. Each laboratory shall appoint a staff member with chemistry-related education and experience to be the chemical administrator.
2. Laboratories purchasing or inputting chemicals for experiment instruction or project research shall ensure the proper management of chemicals.
3. Before the purchase requisition, handling, use, and storage of the toxic and concerned chemical substances announced by the Environmental Protection Administration (EPA), the projected quantity of purchase, use, and safety data sheet (SDS) of such chemical substances shall be reported over the Notes Toxic Chemical Substance Operation System. After the approval of the unit director and university president, the Office of Environmental Protection and Occupational Safety and Hygiene shall apply for the operation permit to the Environmental Protection Department, New Taipei City Government. Chemicals shall be purchased from the dealers or Taiwan distributors of the relevant chemicals only with the approval of the competent authorities. After delivery, chemicals shall be registered in the List of Chemicals for stock management.

Article 8 Use of Chemicals

Before using a chemical, apart from notifying their assistants, students, or other personnel of the process and instrument operation of the experiment and the dangerous properties and potential hazards of chemicals, the Lab managers, course instructors, or project principal investigators shall also show them how to use the relevant protective equipment. The relevant teaching records and signed data shall be properly retained for over three years for the reference of environmental protection units.

Article 9 Procurement of Machinery, Equipment, and Instruments

The purchasing unit shall fill in the purchase requisition and proceed with the procurement regulations based on the annual budget and the “Regulations for Materials Management.” Please refer to the purchase requisition regulations on the MIS or contact the Office of Library and Information Services for

detail. “Dangerous machinery and equipment” and “equipment capable of producing ionizing radiation” shall be purchased according to the application process (Form: A090050510).

Article 10 Layout Planning and Renovation of Laboratories (including outsourcing)

1. Aisles, slab load, dynamic load, daylighting, ventilation, lighting, typhoon, earthquake, and other natural disasters shall be considered in the Lab spatial planning to maintain safety.
2. Safety shall be the prime concern for chemical storage and management. Additionally, toppling as a result of earthquake shall also be prevented. Dangerous chemicals can generally be divided into: flammable liquids, flammable solids, oxidizing substances, corrosive substances, and toxic and concerned chemical substances. They shall be stored separately (by hazard classification, and “incompatibility” shall be considered for the mixed storage of different types of chemicals).
3. When planning a new laboratory or renovating an existing laboratory, the following may be considered for chemical storage:
 - (1) Flammable liquid storage shall be equipped with fire doors (walls) (fire resistance for over two hours) and antistatic floor, and lighting fixtures, broadcasters, ventilation facilities, and electricity sockets shall be explosion proof.
 - (2) Flammable solid storage shall be equipped with the abovementioned fire doors (walls), and sand can be used to extinguish fire.
 - (3) Oxidizing substance storage shall be equipped with the abovementioned fire doors (walls). Substances in this area shall be absolutely segregated from flammable liquids to avoid explosion caused by their contacts.
 - (4) Toxic and concerned chemical substance storage shall be equipped with the abovementioned fire doors (walls). Tools and devices for emergency handling, personal protective equipment (PPE), and emergency spill cabinet for hazardous substances shall be equipped at the entrance. Toxic and concerned chemical substances shall be managed and handled

according to the regulations of the central competent authorities.

- (5) In addition to the abovementioned fire doors (walls) and tools and devices for emergency handling, emergency shower and eyewash and emergency spill cabinet for hazardous substances are recommended in corrosive substance storage.
 - (6) Shelves for storing non-dangerous chemicals. Anti-seismic requirements shall be the prime concern of design.
 - (7) Chinese warning labels shall be attached to all chemicals to respect the right to “be informed” of people.
4. When outsourcing the Lab renovation project, applicants shall fill in the Construction Safety Notice (Form: A090050610) over the MIS to explain the environmental condition, potential hazard factors, and precautions to be taken of the Lab. For the effective safety management of open-fire and dangerous works and works involving special health hazards, the organizing unit shall request contractors to fill in the “Application for Permit and Agreement on Works Safety” (Form: A090050710) to apply for a permit of their works and provide a dependable reference for safety control so as to maintain the safety of people and equipment.

Article 11 Handling of Failures and Discarding of Facilities, Machinery, Equipment, and Instruments

1. To maintain the safety and effective use of facilities, machinery, equipment, and instruments in the Lab, the Lab managers shall maintain the availability of various facilities, machinery, equipment, and instruments at all times. The anomalies are detected, the Lab managers shall fill in the Application for Repair to apply for repair and maintenance. Machinery, instruments, and equipment shall be segregated from the power source, and appropriate protective measures shall be adopted. The “Out of service. Do not use!” label and the repair date shall be indicated at the noticeable location of machinery, equipment, and equipment.
2. When machinery, equipment, and analysis instruments in

the Lab have reached their end of life (EOL) and are unusable anymore, all units shall notify the Office of General Affairs in writing to proceed with the discarding procedure. Such machinery, equipment, and analysis instruments shall be delivered to the temporary storage designed by the Office of General Affairs for the closeout procedure.

3. When discarding machinery, equipment, and/or analysis instruments, the temporary storage and substances contained in the analysis instruments shall comply with the *Waste Disposal Act* and *Toxic and Concerned Chemical Substances Control Act* announced by EPA and the *Ionizing Radiation Protection Act* announced by the Atomic Energy Council under Executive Yuan.

Article 12 Discarding and Disposing of Expired Chemicals

1. When it is necessary to discard expired and remaining chemicals after a content change of experiment courses or project research or unopened chemicals that are no longer useful as a result of deliquescence or solidification caused by environmental factors, the Lab managers or principal investigators of experiments, project research, and research projects shall first request their original suppliers or Taiwan distributors to recover such chemicals. When suppliers cannot recover such chemicals, unit technicians shall consolidate, categorize, and pack such chemicals and outsource their transportation and disposal through the assistance of the Office of Environmental Protection and Occupational Safety and Hygiene.
2. Discarded chemicals shall be classified into organic chemicals and inorganic chemicals by property. Chemicals that cannot be clearly identified due to missing labels, blurred names, and known purity shall all be categorized as unknown chemicals.

Chapter IV Safety and Health Management of Laboratories

Article 13 Significance of Safety and Health

Safety refers to the prevention or elimination of accidents from causing injury, disability, fatality, or property loss. Health (hygiene) refers to the prevention of hazard factors generated in the operating venues from causing health hazards, accelerating ageing, and damaging health.

Article 14 Established in accordance with the *Occupational Safety and Health Act, Toxic and Concerned Chemical Substances Control Act, and Act for Controlling the Handling of Toxic and Concerned Chemical Substances by Academic Institutions*.

Article 15 Equipment Maintenance and Self-Inspection

1. The Lab managers shall implement self-inspection on the mechanical tools, equipment, or instruments within their jurisdiction, create the necessary standard forms, and maintain records of self-inspection.
2. Dangerous machinery or equipment: Dangerous machinery or equipment designated by the central competent authorities shall not be used without the prior qualification by inspection agencies or contract inspection institutions designated by the central competent authorities. After the inspection expires, they shall not be used prior to the re-inspection.
3. Periodic inspection shall be performed on various mechanical tools, equipment, and tools, and their integrity shall be maintained.
4. Please refer to Chapter III of the MCUT Rules for Work Safety and Health for details.

Article 16 Criteria of Occupational Safety and Health

1. To plan the corrective operating methods of the mechanical tools, equipment, and instruments and the operating processes of laboratories and internship shops so as to prevent mistakes and ensure the personal safety and health, the Lab managers shall analysis work safety independently and establish the relevant standard operating procedures (SOP).
2. To prevent chemical accidents, the Lab managers shall implement the hazard communication plan and create the list of hazardous substances in accordance with the *Regulations of Hazard Communication on Dangerous and Harmful Materials*. The Lab managers shall also label and provide the SDS for hazardous substances and arrange education and training for personnel handling and using hazardous substances.
3. Please refer to Chapter IV of the MCUT Rules for Work Safety and Health for details.

Article 17 Education and Training

1. New employees and active employees before a job change shall receive three hours of general education and training on safety and health applicable to the respective workshops. Records shall be maintained and retained for three years.
2. Personnel (including students) using dangerous and harmful materials shall receive at least three hours of hazard communication education and training. Records shall be maintained and retained for three years.
3. Please refer to Chapter V of the MCUT Rules for Work Safety and Health for details.

Article 18 First Response and Rescue

1. First responders shall receive professional training before administering first aid.
2. The director of the unit where an accident breaks out shall take charge of the rescue, while other personnel shall engage with rescue and first aid for the casualties through division of labor.
3. Please refer to Chapter VII of the MCUT Rules for Work Safety and Health for details.

Article 19 Preparation, Maintenance, and Use of Protective Equipment

1. Each laboratory shall select personal protective equipment (PPE) appropriate to the nature of operations and the condition and type of potential hazards. PPE shall be distributed to personnel of the relevant venues, and special staff shall be designated to keep custody of and maintain such PPE.
2. When transporting corrosive or toxic substances, personnel shall wear appropriate gloves, aprons, safety headgear, goggles, masks, and protective shields.
3. Unit directors shall designate personnel to maintain PPE used in common areas.
4. Please refer to Chapter VIII of the MCUT Rules for Work Safety and Health for details.

Article 20 Accident Reporting and Report

1. Operators shall report unsafe conditions to the Lab managers at all times.

2. When the automatic fire reporting system or gas detection alarm system at the accident scene is activated, after verification, on-site personnel shall take immediate action and report to the Campus Safety Center or Office of Environmental Protection and Occupational Safety and Hygiene, or dial 119 to report a fire as necessary.
3. Please refer to Chapter IX of the MCUT Rules for Work Safety and Health for details.

Article 21 Management of Radioactive Operations

1. The Lab radiation protection management shall be implemented. The Lab managers shall create the correct datasheets regarding the name, quantity, becquerel, and location of nuclides in the laboratories.
2. Nuclear sources shall only be operated by qualified operators or under their supervision in instruction and training. Records shall be maintained and achieved for reference.

Article 22 Management of Dangerous and Harmful Materials and Toxic and Concerned Chemical Substances

1. Dangerous materials: Hazardous chemicals and materials containing physical hazards as claimed in the *Regulations of Hazard Communication on Dangerous and Harmful Materials* and complying with the classification in CNS15030.
2. Harmful materials: Materials complying with the classification in CNS15030 and containing health hazards.
3. Toxic and concerned chemical substances: Chemical substances as announced in the *Occupational Safety and Health Act, Toxic and Concerned Chemical Substances Control Act* (subject to the types as announced by the central competent authorities).
4. Apart from maintaining an exact record of handlers handling the manufacture, import, export, sale, transport, use, storage, and discarding of Classes I-IV toxic and concerned chemical substances, the Lab managers shall fill in the “Toxic and Concerned Chemical Substances Handling Record” (Form: A090050810) each day in the EPA-designated format and retain the files either in paper or electronically. However, records of handling toxic and concerned chemical substances without changes can be

omitted.

5. Records of handling Classes I-IV toxic and concerned chemical substances shall be retained for over three years at the point of handling to facture EPA's reference.

Article 23 Labeling of Containers, Packages, and Handling Premises and Facilities

1. Containers or packages mean any bags, cylinders, bottles, boxes, cans, barrels, and other objects that can contain toxic and concerned chemical substances, except storage tanks, pipelines, reactors, and other stationary facilities.
2. Containers and packages of toxic and concerned chemical substances shall comply with the CNS-specified classification and labeling items, and the following items shall be labeled in the noticeable locations in the format as shown in the annex.
 - (1) Hazard pictograms: Bold red square frame vertically aligned at 45° with black pictograms inside in clearly legible size.
 - (2) Content:
 - (a) name, (b) hazard content, (c) warning, (d) hazard warning message, (e) hazard preventive action, and (f) the name, address, and phone number of manufacturer, importer, or supplier.
3. Containers and packages with a volume below 100ml may be labeled only with the name, hazard pictogram, and warning of the toxic chemical substance.
4. Manufacturers and importers of toxic chemical substances shall label each container and package. Buyers and handlers of toxic chemical substances shall ensure the legibility and integrity of label contents.
5. Users shall label the containers and packages of independently dispensed or prepared toxic chemical substances (except for self-use within the Lab). When there are several containers or packages containing chemical substances of the same toxicity for self-use stored at the same place, a notice can be placed at the noticeable location to replace the individual labeling of containers or packages.
6. The labeling as required under these instructions may be

exempted for the containers and packages of toxic and concerned chemical substances meeting the following requirements:

- (1) Internal containers or packages for lining purpose and not intended for removal with labels that have been attached to the external containers or packages.
 - (2) Labeled internal containers or packages, with external containers or packages containing legible labeling facts.
 - (3) Toxic and concerned chemical substances extracted from labeled containers or packages for immediate use during the class.
 - (4) Toxic and concerned chemical substances extracted from labeled containers or packages for use in experiments or research conducted in the Lab.
7. Individual SDSs shall be made with different Chinese and English substance names for toxic and concerned chemical substances carrying the same controlled serial number with composition and concentration differences.
 8. “Handling Site of Toxic and Concerned Chemical Substances” shall be indicated at the entrance of the point of handling of toxic and concerned chemical substances for use in experiments, research, and education at a volume below the handling control limits.
 9. Handlers of toxic and concerned chemical substances shall produce the SDS in the format designated by the central competent authorities and review the accuracy of the SDS content at all times. The updated contents, date of update, and version shall be retained for three years for reference.
 10. Please refer to the “Regulations for Management of Toxic and Concerned Chemical Substances and Safety Data Sheets” for details.

Article 24 Discarding and Disposal of Expired Toxic and Concerned Chemical Substances

1. Due to a content change of experiment courses or project research and other safety reasons, after the application made to unit directors by the instructors, project supervisors, or principal investigators of experiments, project research, and research projects and the approval of

the Toxic Chemical Substance Management Committee, application for discarding shall be made to the Environmental Protection Department, New Taipei City Government. Disposal shall be requested from the original suppliers, Taiwan distributors, or qualified disposal contractors.

2. Handlers of toxic and concerned chemical substances shall fill in the Statement of Validation for Discarding Toxic and Concerned Chemical Substances (Form: A090050910).
3. When discarding substances containing polychlorinated biphenyl (PCB), handlers of toxic and concerned chemical substances shall fill in the Statement of Validation (List) for Discarding PCB-Containing Toxic and Concerned Chemical Substances (Form: A090051110).
4. The Statement of Validation (List) for Discarding Toxic and Concerned Chemical Substances shall be retained by the handlers and at premises for handling toxic and concerned chemical substances, and by the college chemical administrator and the Office of Environmental Protection and Occupational Safety and Hygiene for three years for reference.

Chapter V Prevention of The Lab Pollution (Contamination)

Article 25 Classes and Management of Waste

The types of waste produced from laboratories include waste gases, waste liquids, rinsing wastewater, solid waste, and other classes of waste.

1. Waste gases: Volatile gases generated from experiments that can harm the human health or contaminate the environment. Ventilation equipment shall be activated at all times when handling or storing highly volatile organic solvents or low-vapor-pressure substances or chemicals in laboratories.
2. Waste liquids: Spent chemical liquids produced from instruction or research with threats to harm the environment, safety, and health, excluding radioactive or infectious waste liquids. Waste liquids shall be classified, labeled, and collected in accordance with the EPA-announced waste code and stored in the designated storage.
3. Rinsing wastewater: Wastewater from washing analyzers

and containers after experiments that may contain low-concentration heavy metals and/or organic solvents and may harm the human health or contaminate the environment. Rinsing wastewater from washing the Lab containers in the first three times shall be properly classified, collected, and stored.

4. Solid waste: After boxing, broken glass containers shall be delivered to temporary glass storage area at the recycling site.
5. The classification of discarded chemicals and the Lab waste liquids shall be subject to the MCUT Chemicals Discarding and Waste Liquid Classification Flowchart (Form: A090051210). Attach the “Waste Liquid Class Label” (Form: A090051310) to the containers containing the Lab waste liquids. Resistance against water, moisture, and discoloration shall be considered for labels. Labels shall be attached to the containers or storage cabinets.
6. Each time of discarding, the content and composition of waste liquids shall be recorded in detail in the Waste Liquid Collection Record (Form: A090051410). The record shall be signed in order and retained for reference. For the number of waste liquid barrels, fill in the serial number of waste liquid entry after the file conversion of the entry application form. The number shall be retained for over two years for reference.
7. Storage sites of the Lab waste liquids shall comply with the following requirements:
 - (1) Storage sites shall be labeled at the noticeable locations of sites.
 - (2) Prevent high temperature, direct sunlight, and rain exposure and keep out of fire sources, heat sources, and power sources.
 - (3) Store at solid locations, keep away from toppling, and prevent stacking.
 - (4) Easy to transport and no blocking of aisles.
 - (5) Maintain good ventilation, preferable with ventilators, and prevent fugitive odors.
 - (6) Anti-spill equipment shall be in place to prevent hazards caused by unintended spills.

8. Application for entry of the Lab waste liquids: Before transportation, the Lab managers shall fill in the “Application for Campus Industrial Waste Entry” from the Campus Industrial Waste Management System (<http://system.mcut.edu.tw/lab/>). The approval process of application shall be subject to the Notes system.
 - (1) When the waste liquid barrel is 50–80% full and not exceeding 20L, the Lab managers shall apply for entry to the waste liquid temporary storage site.
 - (2) After filling in the application for entry, the Lab managers shall wait for the approval of the Office of Environmental Protection and Occupational Safety and Hygiene and entry date appointment before shipping waste liquid to the MCUT waste liquid temporary storage site.
9. Others: Matters not provided for in these Regulations shall be subject to MCUT’s environment-related regulations and those announced by EPA.

Article 26 Waste Classification, Collection, and Handling

1. Waste gases: Each department (institute) shall install ventilation equipment in their laboratories and maintain a record of equipment operation.
2. Waste liquid: Apart from proper classification, labeling, collection, and storage, high-concentration waste liquids from experiments shall be classified and collected by chemical property. Incompatible waste liquids shall be classified, collected, and stored according to the “Methods for The Lab Waste Liquid Classification” (Form: A090051510), “The Lab Waste Liquid Class-Label Cross-Reference Table” (Form: A090051610), and “Location of Pictograms on Waste Liquid Barrels” (Form: A090051710).
 - (1) Classification of waste liquids
 - a. Organic waste liquids:
 - (a) Organic halogen-containing solvents
 - (b) Organic halogen-free solvents
 - (c) Organic waste liquid acids
 - b. Inorganic waste liquids:

- (a) Non-toxic mixed waste liquids
 - (b) Arsenic- and compound-containing waste liquids
 - (c) Alkaline waste liquids
 - (d) Acidic waste liquids
 - ① Non-oxidizing acidic waste liquids
 - ② Oxidizing acidic waste liquids
- (2) Each laboratory shall establish the Lab-specific “Chemical Substance Compatibility Table” based on the chemical properties of chemicals (including waste liquids) in the Lab. Rolling adjustment shall be made constantly to the table that shall be posted at the noticeable locations in the Lab and communicated to all the Lab members. The basic formant is shown in Form: A090051810.
- (3) The following effects shall be prevented between the Lab waste liquids and their containers and container materials or when mixing two or more types of industrial waste.
- a. Generation of heat.
 - b. Vigorous reactions, fire, or explosion.
 - c. Generation flammable fluids or hazardous fluids.
 - d. Deterioration of container materials.
- (4) Storage containers of the Lab waste liquids
- a. Collection of storage containers for the Lab waste liquids:

The Office of Environmental Protection and Occupational Safety and Hygiene shall centrally purchase containers with good chemical resistance, such as HDPE storage barrels, for use by the laboratories and internship workshops of departments and R&D centers.
 - b. Storage containers shall be compatible with the Lab waste liquids. Incompatible hazardous waste liquids shall be stored individually and sealed at all times.
 - c. Storage containers shall be maintained in good condition and replaced immediately when cracks,

damage, or threats of leaking are detected. Keep containers clean at all times.

- d. To prevent storage containers from leaking, storage containers containing the Lab waste liquids shall be placed on a drain pan with capacity of over 1.1 times the container.

Chapter VI Maintenance of The Lab Data

Article 27 Creation

1. The Lab data provides a reference for identifying and understanding all potential hazards inside the Lab. The Lab data is created to facilitate the Lab academic and non-academic staff to identify and understand the chemical, physical, biological, and radioactive hazards; establish complete written procedures and documents; understand the correct operations and precautions; and comply with the relevant safety procedures and regulations.

2. The Lab safety data required for documentation and institutionalization is as follows:

- (1) Safety and health basic data:

The Lab management rules, emergency report processes, evacuation routes, List of The Lab Chemicals (Form: A090051910), SDS, operating environment monitoring, and management (including periodic inspection of qualification certificates and operator licenses) of dangerous machinery and equipment and important machinery and equipment.

- (2) Survey data

Workplace layout; layout of machinery, instruments, and equipment; statistics on the distribution of dangerous and harmful materials, toxic materials, and waste liquids; list of operators (including emergency contact phone numbers).

- (3) Operations and control of machinery, equipment, and instruments

Including the specifications, standard operating procedures (SOP), user's manuals, and supplier or distributor data of machinery, equipment, and instruments.

(4) Maintenance, repair, and self-inspection

Each labor shall implement the self-inspection program, maintain inspection records, follow up improvements, and create the routine maintenance and repair system for machinery, equipment, and instruments to maintain the normal operation of machinery, equipment, and instruments and enhance operating reliability. Records of maintenance, repair, and self-inspections shall be maintained and retained, and the causes of failure shall be analyzed and reviewed.

(5) Emergency response plan

Each laboratory shall establish its own emergency response plan in respect of the types and quantity of chemicals used, the Lab operation conditions, background data of the workplace and surroundings, evacuation routes, personnel, and rescue equipment.

Article 28 Data Update and Use

The Lab managers shall revise the Lab data each March and October based on the actual laboratory condition and deliver the safety and health basic data, survey data, and emergency response data to the unit director and Office of Environmental Protection and Occupational Safety and Hygiene for reference to facilitate data use in emergency rescue.

Article 29 Accident Emergency Response

Apart from property managing the Lab safety and maintaining the Lab data at ordinary times, the Lab managers shall also plan resources and facilities for emergency resources on the characteristics of each laboratory. When a laboratory accident breaks out, apart from reporting the accident according to the reporting process, the Lab managers shall also guide personnel to evacuate according to the evacuation routes and minimize the affected area and loss. After the accident, the Lab managers shall investigate the causes of accident and propose corrective action.

Chapter VII Addendum

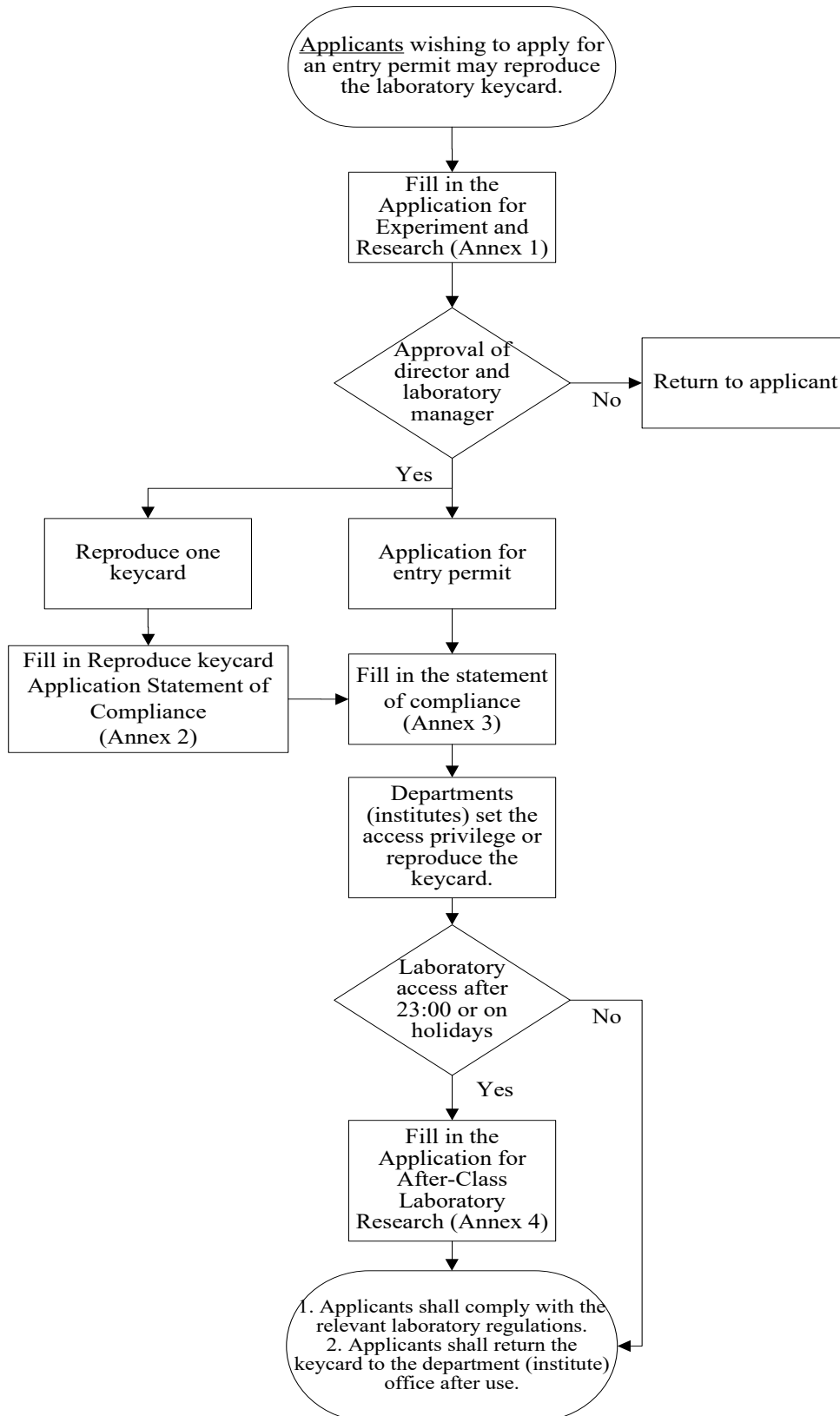
Article 30 Supervision and Inspection

To implement operations relating to the Lab management, the

President's Office, Office of Environmental Protection and Occupational Safety and Hygiene, offices, colleges, and R&D centers shall review these operations from time to time and maintain the relevant records. Detected anomalies shall be reported to the relevant units and laboratories to make improvement. The progress of improvement shall be followed up and verification shall be implemented before closing a case.

Article 31 These Regulations shall be announced and implemented after the passage of the Labor Safety and Health Management and Concerned Chemical Substance Handling Committee Meeting and approval of the university president. The same shall apply to the amendments hereto.

Ming Chi University of Technology Completion Flow of Laboratory Management Forms



Description:

1. Please follow the above procedures when it is necessary to use the laboratory for the project and research needs and apply for an entry permit or reproduce the keycard.
2. Borrow a keycard or key from the department (institute) office when using the laboratory for instruction and return it to the department (institute) office after use.

Ming Chi University of Technology
Application for The Lab Research

- I. Name of The Lab** _____
- II. Applicant:** _____ **Student (employee) No.:** _____
Class/Year: _____ **Phone:** _____
- III. Duration: From** _____ **to** _____
- IV. The Lab Location** _____
- V. Brief Description of Experiment or Research Content (including safety assessment):**

VI. Chemicals or Equipment Used:

VII. Safety and Protection Notification (to be completed by advisors and verified by the Lab managers)

Signature of Advisor:

(Unit Director)

Signature of Applicant:

Signature of Department Chair:

(The Lab supervisor)

Signature of the Lab Manager: _____

Department/Institute Office: Set access privilege Reproduce keycard

Case Officer: _____

Fill in the statement of compliance

Fill in the Statement of Non-Reproduction of The Lab Key

(Required only for keycard reproduction)

Form: A090050110

One copy: (After application approval, the department/institute office shall keep the original copy and the applicant shall keep the photocopy. The original copy shall be retained for at least three years.)

Process for staff application: Applicant→ Unit Director→ The Lab Manager→ Department Chair→ Each of the applicant and department/institute office keeps one copy.

Process for student: Applicant→ Advisor→ The Lab Manager→ Department Chair→ Each of the applicant and department/institute office keeps one copy.

Department of _____

Ming Chi University of Technology

Statement of Non-Reproduction of The Lab Key

Due to

research/internship needs, it is necessary to apply for reproduction of the key (one) of the _____ Lab from the Office of the Department/Institute of _____. Apart from not reproducing the keycard, I hereby agree to keep the key with due care and strictly follow the provisions in the Regulations for the Lab Management. I also agree to return the key after use and accept disciplines under the MCUT University Rules for my violation of any provisions of the Regulations for the Lab Management.

Name of Stipulator:

Class/Year/Department/Institute:

Student (Employee) No.:

Advisor (Principal Investigator):

The Lab Manager:

Department Chair

Date:

Form: A090050210

Statement of Compliance

I have read through the MCUT Regulations for the Lab Management and Rules for the Lab Management. Apart from following the relevant provisions, I also agree to accept disciplinary measures under the MCUT University Rules and take the relevant responsibilities.

Name of Stipulator:
Student (Employee) No.:

Advisor (Principal Investigator):
The Lab Manager:
Department Chair

Date:

Form: A090050310

Rules for The Lab/Internship Workshop Management

These Rules are specifically established to ensure the safety and maintenance of laboratories and internship workshops, strengthen practical skills, and improve the efficacy of internship and experiment courses.

General Rules

1. The Lab/internship workshop managers shall keep custody and manage laboratories/internship workshops, take charge of the self-inspection and safety and health of laboratories/internship workshops, and fill in the relevant forms and records.
2. Aisles, emergency exit doors, escape stairs, and entrances and exits shall be kept clean and clear. Fire equipment and safety protection equipment shall be in good and serviceable condition.
3. No smoking, eating or drinking, and frolicking shall be allowed in laboratories/internship workshops. No fire shall be used without permission.
4. Do not put food and beverages together with chemicals in the refrigerators.
5. Safety and health equipment and protective equipment for handling hazards shall be equipped at points that are noticeable and easy to access.
6. Machinery and equipment used in laboratories/internship workshops shall comply with the safety standards for use by workers and students as designated by the central competent authorities.
7. Dangerous machinery and equipment (e.g. boilers, pressure vessels, and containers for high-pressure gases) shall not be used prior to qualification or re-qualification after expiration. Such equipment shall be operated by qualified license holders.
8. Containers (any bags, bottles, boxes, cans, reactors, tanks, pipelines) for storing dangerous or harmful materials in laboratories/internship workshops shall be labeled according to the relevant regulations. An SDS shall be prepared at points of easy access for each material.
9. Venues shall be kept clean. Chemicals, instruments, and equipment shall be placed in appropriate locations. Environmental clean-up shall be implemented periodically.
10. Warnings and work rules inside the Lab shall be unfailing complied.
11. Unauthorized the Lab access of non-MCUT students/staff and unauthorized engagement with matters unrelated to research are strictly prohibited.

Regulations for Internship and Experiments

1. Wear suitable workwear and work shoes during internship or an experiment. Do not wear ornaments or tie long hair to the back.
2. Before using machinery, equipment, and experiment samples, read the relevant manuals and get familiar with the safety precautions and use them according to the standard operating procedures.
3. During internship and an experiment, students shall pay attention to safety at all times and shall not turn on the power or activate machinery, instruments, or equipment unrelated to the internship or experiment without the permission of the course instructor (or management personnel).
4. During internship, students shall wear the necessary PPE and comply with all methods for ensuring operation safety.
5. No dangerous and harmful materials, semi-finished products, and waste shall be placed at random in the internship workshop or the Lab. They shall be stored in the designated location and shall not be moved without the permission of the Lab manager.
6. Strictly follow the instructions to operate volatile chemicals inside the Lab exhaust hood.

- 7. Keep the exhaust and lighting equipment in internship workshops and laboratories in good and serviceable condition.**
- 8. The required safety and health protective equipment of machinery, equipment, and tools shall not be removed at random or failed. Immediately report to the workshop or the Lab manager or the course instructor when removed or failed protective equipment is detected.**
- 9. Waste materials, semi-finished products, and refuse from internship shall be stored individually in the designated locations.**
- 10. Before leaving the internship workshop and the Lab, check and shut down water supply, power supply, gas supply, and windows. Workshop or the Lab managers shall check these after the end of internship.**

Regulations governing anomalies

- 1. When failed machinery or instruments need repair, or machinery and power equipment is faulty, shut down such equipment immediately and hang warning signs on and lock the power switch before checking and repairing to prevent accidents.**
- 2. After detecting an occupational accident or unsafe condition, report to the Office of Environmental Protection and Occupational Safety and Hygiene (ext. 4056) immediately, and emergency response action shall be taken for all injuries and accidents.**
- 3. When there are threats of immediate hazards at the internship workshop, the Lab, or workplace, internship workshop or the Lab managers shall shut down all operations immediately and evacuate workers and students to a safe place.**

Application for Evening and Holiday Experiment and Research

Duration (weeks): From		to	
The Lab			Applicant
Class/Year			Student (Employee) No.:
Session	<input type="checkbox"/> Monday -----	<input type="checkbox"/> Tuesday -----	<input type="checkbox"/> Wednesday -----
	<input type="checkbox"/> Friday -----	<input type="checkbox"/> Saturday -----	<input type="checkbox"/> Sunday -----
Reasons for application	<input type="checkbox"/> Experiment manipulation	<input type="checkbox"/> Coursework discussion	<input type="checkbox"/> Thesis writing
	<input type="checkbox"/> Others		
Please specify:			
The Lab Manager		Signature of Advisor	Signature of Student
College Dean		Department Chair	
Dos and Don'ts	<ol style="list-style-type: none"> 1. Fill in this form to apply for using laboratories after 18:00 and on holidays in advance for project and research needs. 2. Please comply with the relevant laboratory management regulations. Violation shall be disciplined according to the MCUT University Rules. 3. Shut down power supply, clean the Lab, and lock the door before leaving. 		

Approval by duration of booking: One week: Applicant→ Advisor→ The Lab Manager
 One month: Applicant→ Advisor→ The Lab Manager→ Department Chair
 One semester: Applicant→ Advisor→ The Lab Manager→ Department Chair→ College Dean

This is a two-copy application form. Each of the Lab and department/institute office shall keep one copy.

Ming Chi University of Technology

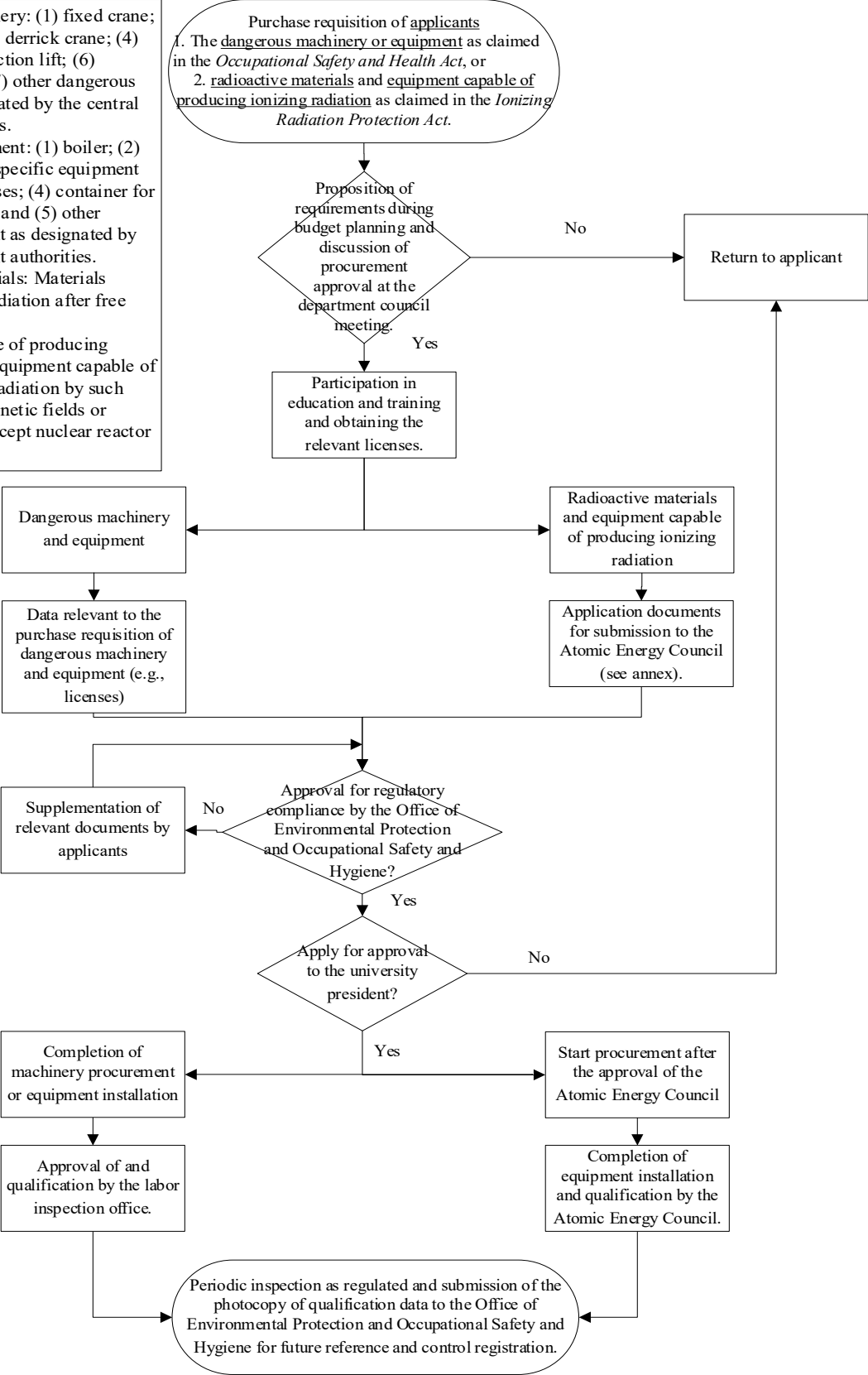
Purchase Requisition Process for Dangerous Machinery or Equipment and Radioactive Materials or Equipment

©Dangerous machinery: (1) fixed crane; (2) mobile crane; (3) derrick crane; (4) elevator; (5) construction lift; (6) hoisting cage; and (7) other dangerous machinery as designated by the central competent authorities.

©Dangerous equipment: (1) boiler; (2) pressure vessel; (3) specific equipment for high-pressure gases; (4) container for high-pressure gases; and (5) other dangerous equipment as designated by the central competent authorities.

©Radioactive materials: Materials releasing ionizing radiation after free nuclear fusion.

©Equipment capable of producing ionizing radiation: Equipment capable of producing ionizing radiation by such means as electromagnetic fields or nuclear reactions, except nuclear reactor facilities.



Form: A090050510

Construction Safety Notification

Project No.		Company	E	Project		Project duration	From _____ to _____
Construction location		Contractor				Contract construction duration	From _____ to _____
Workplace Environment				Potential Hazard Factor		Required Safety and Health Measures	
Commissioned by	Supervisor:		Case Officer:	(Phone:)	ESH by:	
Supervised by:	Supervisor:		Case Officer:	(Phone:)	Supervisor:	Case Officer:
Contractor Statement of Compliance	<p>The safety and health precautions of the Project, including campus access management regulations, campus common safety and health regulations (already annexed to the Contract), and workplace safety and health instructions, have been informed by the Client on _____ and fully acknowledged by the Company. All personnel (including the contractor and its employees) have been informed of such precautions prior to entry to the workplace. The contractor shall assume full responsibility for the personal injury and property loss caused for violating these precautions as verified by surveyors.</p> <p>Either before or after campus entry, when it deems necessary by the Client's security guards, supervisor, and industrial safety personnel: The contractor and its employees shall voluntarily cooperate with the full security check of vehicles or personal belongings. The contractor and its employees shall put on the workwear and use the other tools supplied by the Client.</p> <p>In addition to deducting NT\$10,000 for each person (incident) from the contractor, the Client shall request the person or vehicle refusing to cooperate to leave the campus immediately and reject their re-entry to the campus.</p> <p>Director or worksite director: _____ Safety and health management personnel: _____</p>						

Form: A090050610

Application for Work Safety Permit

Form No.:

Application date:

(YYYY.MM.DD)

Permit Application	Application department		Construction location	
	Project		Project No.	
	Contractor		Contractor worksite safety and health officer	
	Job content			
	Projected duration of construction	From _____ to _____		
	Type of operation	<input type="checkbox"/> Open-fire operation: <input type="checkbox"/> Electric welding <input type="checkbox"/> Gas welding <input type="checkbox"/> Blowtorch <input type="checkbox"/> Burning <input type="checkbox"/> Grinding <input type="checkbox"/> Tie-In <input type="checkbox"/> Others: <input type="checkbox"/> Confined space operation <input type="checkbox"/> Hypoxia operation <input type="checkbox"/> Working at height <input type="checkbox"/> Hoisting or lifting crane with personnel working at height <input type="checkbox"/> Scaffold erection and demolition <input type="checkbox"/> Live (proximity) working <input type="checkbox"/> Temporary electricity <input type="checkbox"/> Trench excavation <input type="checkbox"/> Lifting and hoisting <input type="checkbox"/> Ionizing radiation operation <input type="checkbox"/> General operation <input type="checkbox"/> Vehicle or machinery operation in the process area <input type="checkbox"/> Waterjet operation <input type="checkbox"/> Personnel entry into expansion site for project inspection and acceptance <input type="checkbox"/> Opening manhole (without entry)		
Assigned supervisor: Judgement of impact on related units: <input type="checkbox"/> Yes <input type="checkbox"/> No Name of related units _____ <div style="display: flex; justify-content: space-between; margin-top: 10px;"> Deputy dean/director: _____ Applicant: _____ </div>				
Equipment Department	Assigned safety supervisor: <input type="checkbox"/> Environmental safety preparation has been completed and verified before construction. Approve for construction. Judgement of impact on related units: <input type="checkbox"/> Yes <input type="checkbox"/> No Name of related units _____ (No senior manager's approval is required, if no cross-functional department exists.) Dean/director: _____ Dean/director: _____			
	Countersigning of related units: Assigned safety supervisor: Required precautions: <div style="display: flex; justify-content: space-between; margin-top: 10px;"> Dean/director: _____ Safety and health management personnel: _____ </div>			
Description	<ol style="list-style-type: none"> 1. The application unit shall fill in the Permit Application section of this form before construction. After the director of the application unit assigns a supervisor (outsourced construction projects) and approves the application, submit to the equipment management department for countersigning. 2. After countersigning the application and assigning a safety supervisor, the equipment department shall delivery the application to the Office of Environmental Protection and Occupational Safety and Hygiene before construction and conduct the safety inspection together with the Office of Environmental Protection and Occupational Safety and Hygiene. 3. The safety supervisor of open-fire operation and confined space (hypoxia) operation shall supervise the complete operation (including extended operation that supervisor shall supervise operation until the end). 4. A new application shall be made after a change in the approved time, location, content, and operations of construction prior to continue operation. 			

Form: A090050710

Table 1

Record of Handling Toxic Chemical
Substances

Record time

Date:

Form completion date:

Page of

Chinese name of toxic chemical substance: (one report for each toxic chemical substance at one handling premises)						Control No.--Serial No.: □□□-□□						Signature or seal of record-taker:									
Concentration (W/W%)						State of substance		□Solid □Liquid □Gas													
Handler:						Address: Phone: ()															
Handling Premises		Name:						Control and No. □□□□□□□□													
		Address:																			
		Phone: ()																			
		Permit No./Registration No./Approval No.																			
Balance in previous month:						Unit: □MT □KG □G															
Date		Handling behavior and weight										Balance (self-imposed management)	The name of the company and factory regarding the source or flow of toxic chemical substance and its permit number/registration number/approval number/address of overseas supplier			Remarks					
Month	Day	Handling quantity remain unchanged	Manufacture	Import	Export	Sales				Use	Storage (warehousing)		Discarding	Others		Weight	Name of company and factory (create upstream and downstream relations first)	Permit No./Registration No./Approval No./Address of Overseas Supplier	Purpose code (behavior of use is required)	Delivery Order No. (fill in according to the delivery regulations)	Remarks (state special condition)
						Buy	Sell	Input	Output		Increase (including inbound transfer)	Reduce (including outbound transfer)		Special condition	Return of residual gas						

Form: A090050810

Table 2

Record of Handling Concerned Chemical Substances

Record period Date:

Form completion date:

Page of

Chinese name of toxic concerned substance: (one report for each toxic chemical substance at one handling premises)		Control No.--Serial No.: □□□-□□										Signature or seal of record-taker:							
Handler:		State of substance □Solid □Liquid □Gas																	
Address:		Address: ()																	
Phone:		Phone: ()																	
Name:		Control and No. □□□□□□□□																	
Handling Premises	Address:																		
	Phone: ()																		
	Approval No.																		
	Balance in previous month:					Unit: □MT □KG □G													
Date	Handling behavior and weight										Balance (self-imposed management)	The name of the company and factory regarding the source or flow of concerned chemical substance and its permit number/registration number/approval number/address of overseas supplier		Remarks					
	Handling quantity remain unchanged	Manufacture	Import	Export	Sales				Use	Storage (warehousing)		Discarding	Others		Weight	Name of company and factory (create upstream and downstream relations first)	Approval number/Address of overseas supplier	Delivery Order No. (fill in according to the delivery regulations)	Remarks (state special condition)
Buy	Sell	Input	Output	Increase (including inbound transfer)	Reduce (including outbound transfer)	Special condition	Return of residual gas												

Form: A090050810

(Full title of the handler of toxic and hazardous concerned chemical substances) List
of Discarded Chemical Substances

Application date:

Details of Discarded Toxic Chemical Substances	Material		Name				Remarks
			Quality ³				
	Toxic and Hazardous Concerned Chemical Substances	Control No.-Serial No.					
		Concentration	Composition Name ¹				
	Storage location in handling premises						
Waste Disposal Data	Waste		Name		Estimated time of disposal completion ³		
			Code				
	Disposal organization	Clearance and disposal organization	Name		Control No.		
			Contact person		Phone		
		Disposal organization	Name		Control No.		
			Contact person		Phone		
Details of Discarded Toxic Chemical Substances	Material		Name				Remarks
			Quality ³				
	Toxic Chemical Substances	Control No.-Serial No.					
		Concentration	Composition Name ¹				
	Storage location in handling premises						
Waste Disposal Data	Waste		Name		Estimated time of disposal completion ³		
			Code				
	Disposal organization	Clearance and disposal organization	Name		Control No.		
			Contact person		Phone		
		Disposal organization	Name		Control No.		
			Contact person		Phone		
Details of Discarded Toxic Chemical Substances	Material		Name				Remarks
			Quality ³				
	Toxic and Hazardous Concerned Chemical Substances	Control No.-Serial No.					
		Concentration	Composition Name ¹				
	Storage location in handling premises						
Waste Disposal Data	Waste		Name		Estimated time of disposal completion ³		
			Code				
	Disposal organization	Clearance and disposal organization	Name		Control No.		
			Contact person		Phone		
		Disposal organization	Name		Control No.		
			Contact person		Phone		

¹ When discarding toxic substance polychlorinated biphenyl (PCB), replace this form with the "Declaration of Details of Discarding Toxic Chemical Substance PCB."

² Contents shall be expressed in weight percentage (W/W) for weight and volume percentage (V/V) for gases. Quantity is expressed in SI units (e.g. MT, KG).

³ The estimated time of disposal completion shall not be long than one year after the form completion date. The toxic and hazardous concerned chemical substances declared for discarding shall be disposed of in accordance with the relevant provisions of the *Waste Disposal Act*. Storage shall not exceed the duration (based on the date approved by the letter from the local environmental protection authorities) as stipulated in the *Waste Disposal Act*. Otherwise, disciplinary action shall be taken in accordance with the *Waste Disposal Act*. The fine for hazardous waste shall be NT\$60,000 to NT\$300,000. Fines shall be imposed continuously for failure to complete improvement by the advised time limit. Contractors that need to submit the Industrial Waste Disposal Plan or declare the flow of disposal of industrial waste over the internet shall also submit or change the Industrial Waste Disposal Plan and declare the disposal flow over the internet. Please call the toll-free hotline at 0900-059777 for questions regarding waste disposal.

⁴ Waste that cannot be disposed of in accordance with the *Waste Disposal Act* shall not be discarded. Toxic and hazardous concerned chemical substances that can be returned to the manufacturers or distributors, sold or transferred to others, or returned for export shall not be discarded.

⁵ Use separate sheets when space is not enough.

Form: A090051010

(For PCB only)

List of Discarded Toxic Substance PCB

Application date:

Toxic Chemical Substance PCB	Details of Discarded Toxic Chemical Substance PCB		No. ¹		Name of Material		Remarks	
			PCB Content % w/w		Form (specifications)			
			Manufacturer		MFG No.			
			MFG Date		Use Cessation Date			
			Storage Location in Handling Premises					
Discarded PCB Disposal Data	Waste		Name		Estimated time of disposal completion ²			
			Code					
	Disposal organization	Clearance and disposal organization	Name		Control No.			
			Contact person		Phone			
		Disposal organization	Name		Control No.			
			Contact person		Phone			
Toxic Chemical Substance PCB		Details of Discarded Toxic Chemical Substance PCB		No. ¹		Name of Material		Remarks
				PCB Content % w/w		Form (specifications)		
				Manufacturer		MFG No.		
				MFG Date		Use Cessation Date		
				Storage Location in Handling Premises				
Discarded PCB Disposal Data	Waste		Name		Estimated time of disposal completion ²			
			Code					
	Disposal organization	Clearance and disposal organization	Name		Control No.			
			Contact person		Phone:			
		Disposal organization	Name		Control No.			
			Contact person		Phone			

¹ One number shall be assigned for each set of electrical equipment.

² The estimated time of disposal completion shall not be long than one year after the form completion date. The toxic declared for discarding shall be disposed of in accordance with the relevant provisions of the *Waste Disposal Act*. Storage shall not exceed the duration (based on the date approved by the letter from the local environmental protection authorities) as stipulated in the *Waste Disposal Act*. Otherwise, disciplinary action shall be taken in accordance with the *Waste Disposal Act*. The fine for hazardous waste shall be NT\$60,000 to NT\$300,000. Fines shall be imposed continuously for failure to complete improvement by the advised time limit. Contractors that need to submit the Industrial Waste Disposal Plan or declare the flow of disposal of industrial waste over the internet shall also submit or change the Industrial Waste Disposal Plan and declare the disposal flow over the internet. Please call the toll-free hotline at 0800-059777 for questions regarding waste disposal.

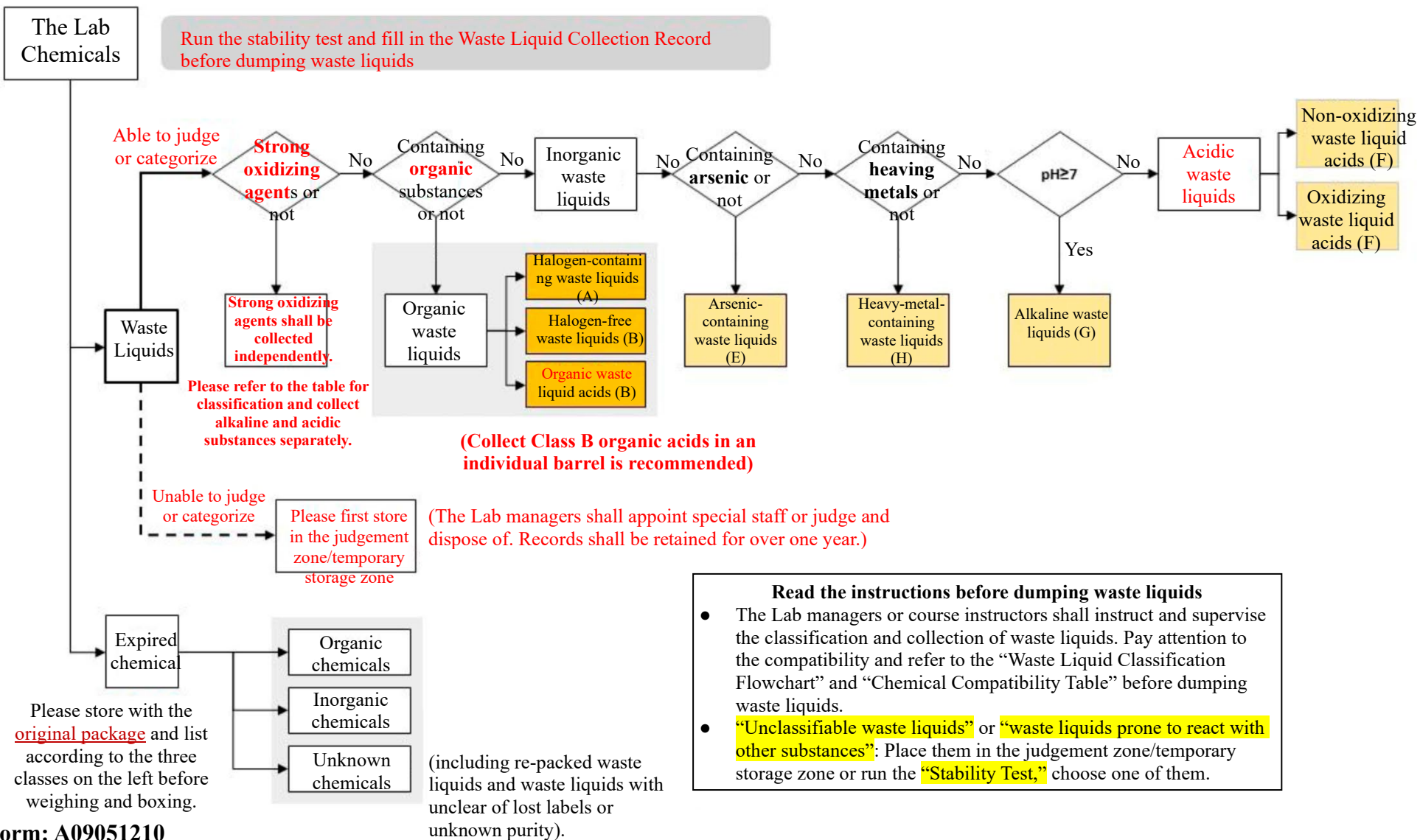
³ Omit when containing no PCB.

⁴ Waste that cannot be disposed of in accordance with the *Waste Disposal Act* shall not be discarded. Toxic chemical substances that can be returned to the manufacturers or distributors, sold or transferred to others, or returned for export shall not be discarded.

⁵ Use separate sheets when space is not enough.

Form: A090051110

Chemical Discarding and Waste Liquid Classification Flowchart



Waste Liquid Collection Record

Department/Institute/Center Unit: _____ Entry No.: _____

The Lab Name: _____ (fill in the entry number after the application for entry)

Notice (read before filling in the form)

1. The Lab managers or course instructors shall instruct and supervise the classification and collection of waste liquids. (Please refer to the “Waste Liquid Classification Flowchart.”)
2. **Principles of classification of waste liquids**
 - **Waste liquids that can be judged or categorized**
 - a. “Strong oxidizing agents” shall be collected individually in the collection barrels for alkaline waste liquids and acid waste liquids.
 - b. Although “organic acids” and “halogen-free organic solvents” are both Class B waste liquids, they shall be collected in individual barrels.
 - c. “Inorganic waste liquid acids” shall be classified into non-oxidizing waste liquid acids and oxidizing waste liquid acids and collected in individual barrels.
 - **Waste liquids that cannot be judged or categorized:** Store in the judgement zone/temporary storage zone for special staff to assist with disposal or run the “Stability Test” (see below). Choose one of them.
3. The “stability test” shall be run by two or more personnel under proper safety protection. Extract a small amount of waste liquid from the waste liquid barrel and run the titration test with the waste liquid produced from the experiment. If no incompatible reaction, such as heat or gas generation, takes place, pour it gently into the waste liquid barrel.
4. A detail record of dumping shall be maintained. Apply for entry into the waste liquid temporary storage site when about 10–16 liters (50–80%) of waste liquids are collected. Do not apply for entry after the content reaches 20 liters. **Regardless of the volume of waste liquids, the waste liquid barrel shall be cleared at least once a year.**
5. Use separate sheets when space is not enough. Dumping personnel shall sign the record in order and retain it for future reference. Fill in the entry number after the application for entry.

Item	Type of waste liquid				
	Date of production (Gregorian calendar)	Composition of experiment waste liquids	Check the box when no anomaly is detected in the stability test	Collection volume (L)	Dumping personnel (please sign)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

Form: A090051410

Waste Liquid Collection Record (Cont'd)

Department/Institute/Center Unit: _____ Entry No.: _____

The Lab Name:

(fill in the entry number after the application for entry)

Item	Type of waste liquid				
	Date of production (Gregorian calendar)	Composition of experiment waste liquids	No anomaly detected in the stability test	Collection volume (L)	Dumping personnel (please sign)
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					

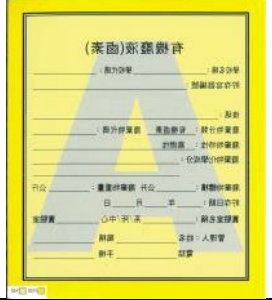





Form: A090051410



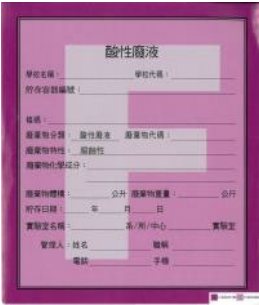



Methods of Classification of The Lab Waste Liquids

Class	Label for Major Waste Liquid Class	EPA Code	Waste Liquid Type	Waste Liquid Composition
Strong oxidizing agents	The properties of strong oxidizing agents shall be distinguished and judged by composition, concentration, and attributes. They shall be properly classified and stored in individual barrels to prevent mixing with waste liquids of other attributes.			The composition described below is for example only. Waste liquids can contain other substances. Please look up the related literature for classification and judgement. They shall be properly classified and collected in safe premises.
	G	D-1502	Alkaline waste liquids	Alkaline as proven by the pH test.
	F	D-1503	Acidic waste liquids	Ex: Hypochlorous acid and nitric acid.
	H	D-1599	Heavy-metal-containing waste liquids	Ex: Potassium dichromate and potassium permanganate.
Organic waste liquids	A	D-1504	Halogen-containing organic waste liquids	Compounds containing aliphatic halogen: such as chloroform, chloromethane, dichloromethane, tetrachloromethane, and iodomethane; or compounds containing aromatic halogen: such as chlorobenzene. and benzyl chloride.
	B	D-1504	Halogen-free organic waste liquids	Compounds containing no aliphatic halogen or compounds containing no aromatic halogen.
	B	D-1504	Organic waste liquid acids	Acidic organic compounds: such as formic acid, acetic acid, and propanoic acid.
Inorganic waste liquids	E	C-0106	Arsenic- and arsenic compound-containing waste liquids	Arsenic-containing waste liquids: such as organic arsenic, inorganic arsenic, and arsenic trioxide.
	H	D-1599	Non-hazardous mixed waste liquids (containing heavy metal ions)	Waste liquids containing any one type of heavy metal ions (e.g. iron, cobalt, copper, manganese, cadmium, lead, gallium, titanium, germanium, tin, aluminum, magnesium, nickel, zinc, silver)
	G	D-1502	Alkaline waste liquids	Waste liquid alkaline
	F	D-1503	Acidic waste liquids	Non-oxidizing waste liquid acids
	F	D-1503	Acidic waste liquids	Oxidizing acidic waste liquids

Form: A090051510

The Lab Waste Liquid Classification-Label Cross-Reference

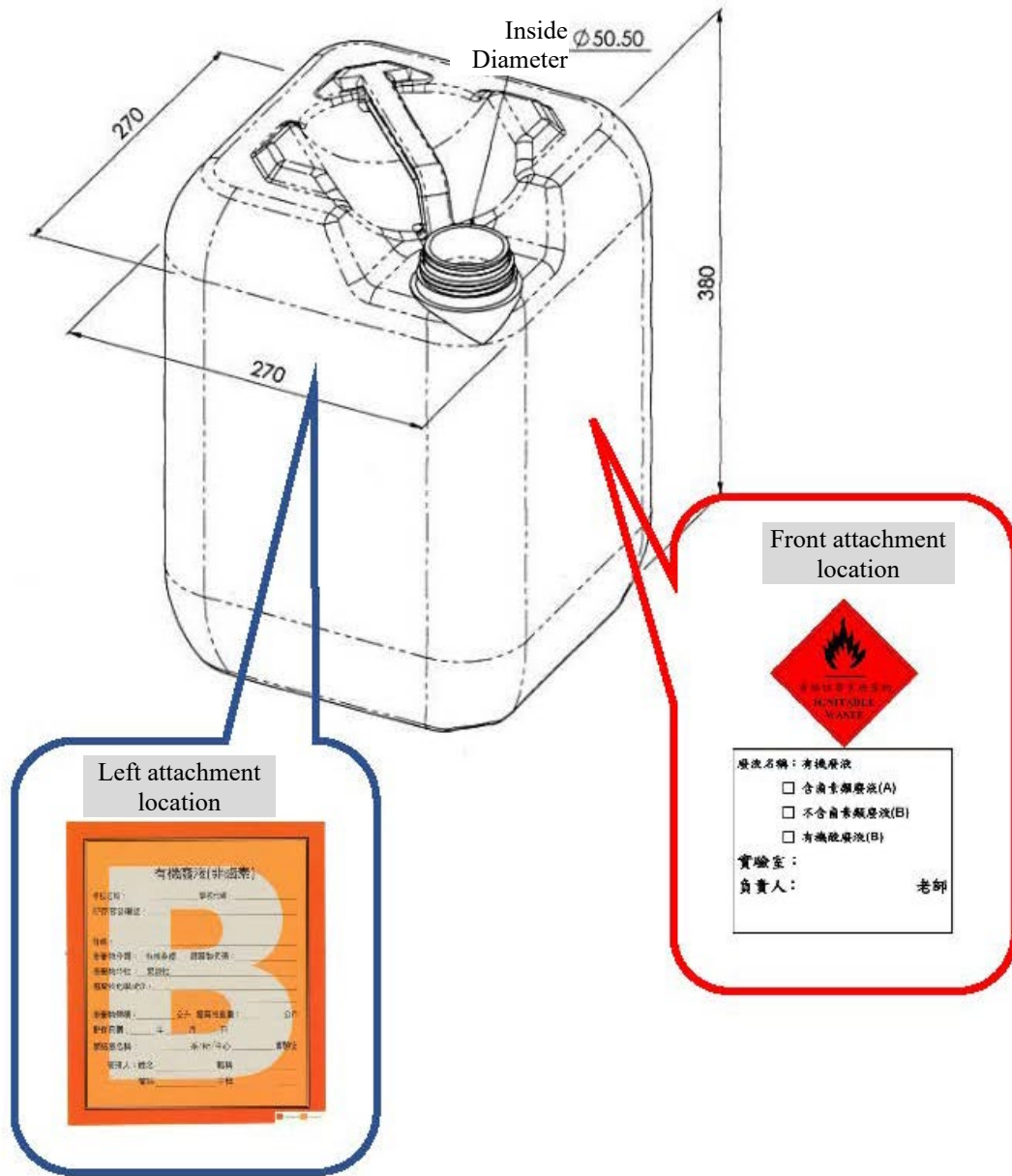
Class	EPA Code	Type	Classification Sticker	The Lab Classification Label
Organic waste liquids	D-1504	Halogen-containing organic solvents		 <p>廢液名稱：有機廢液</p> <p><input type="checkbox"/> 含鹵素類廢液(A)</p> <p><input type="checkbox"/> 不含鹵素類廢液(B)</p> <p><input type="checkbox"/> 有機酸廢液(B)</p> <p>實驗室： 負責人： 老師</p>
	D-1504	Halogen-free organic solvents		
	D-1504	Organic waste liquid acids		
Inorganic waste liquids	D-1599	Non-hazardous mixed waste liquids (containing heavy metal ions)		 <p>廢液名稱：非有害性混合廢液 (H)(含重金屬離子)</p> <p>實驗室： 負責人： 老師</p>

	C-0106	Arsenic- and arsenic compound-containing waste liquids		 <p>廢液名稱：砷及其化合物廢液 (H)</p> <p>實驗室： 負責人： 老師</p>
	D-1503	Non-oxidizing waste liquid acids		 <p>廢液名稱：酸性溶液(F)</p> <p><input type="checkbox"/> 非氧化性酸 <input type="checkbox"/> 氧化性酸</p> <p>實驗室： 負責人： 老師</p>
	D-1502	Oxidizing acidic waste liquids		 <p>廢液名稱：鹼性溶液 (G)</p> <p>實驗室： 負責人： 老師</p>
		Alkaline waste liquids		

Note: The classification method has been established with reference to the “MOE Criteria for Temporary Classification of School the Lab Waste Liquids” and the “EPA Industrial Waste Code and Classification Methods.”

Form: A090051610

Illustration of location of label attachment of waste liquid barrels.



Form: A090051710

Description

1. Safety measures for the containers and premises storing waste liquids.

The safety measures for the containers and premises storing waste liquids shall include the following:

- (1) Storage premises shall be able to protect waste against weathering and natural disasters such as wind, rainfall, and earthquake, and vandalism.
- (2) Storage containers shall remain sealed and leakage-free at all times and shall be compatible with the waste contained. HDPE barrels with 20L capacity are preferable.
- (3) Waste liquids shall be stored individually. Mixed storage of non-compatible waste liquids shall be avoided. Labels containing the name, code, and properties of the content, the name of the Lab and the Lab manager, and the capacity of containers shall be attached on the waste containers.
- (4) Special waste, such as explosion-prone waste at high temperatures shall be stored at low temperatures.
- (5) An alarm system shall be equipped at the storage premises and inspected periodically.

2. Precautions for storage of waste liquids

- (1) Waste liquids or waste containing high-activity compounds, concentrated oxidizing agents or reducing agents shall absolutely not be mixed with other chemical waste.
- (2) Verify the compatibility of different waste liquids prior to mixing them.
- (3) To prevent spills, check the liquid level of the waste liquid barrel before adding new waste liquids. Always maintain waste liquid volume at 70–80% of the barrel capacity. Do not fully load a waste liquid barrel.
- (4) Use a funnel and drain pan to prevent spillover.

3. Definition of incompatibility

The following reaction occurs after mixing incompatible substance, they are incompatible substances.

- (1) Generation of heat.
- (2) Vigorous reactions, fire, or explosion.
- (3) Generation flammable fluids or hazardous fluids.
- (4) Deterioration of container materials.

4. Safety precautions for handling waste liquids

- (1) Always wear protective goggles, gloves, and the Lab gowns before handling chemical waste liquids.
- (2) Dump fume- and steam-producing waste liquids in the Lab exhaust hood.

Form: A090051710

This table is for reference only. Each laboratory may revise the contents based on its actual needs.

Chemical Substance Compatibility Table of _____ The Lab, Department of (Center for) _____

Revision based on the chemical classes
in the The Lab

反應類編號	反應類編號	實驗室使用藥品															
1	酸、礦物 (非氧化性)		1														
2	酸、礦物 (氧化性)			2													
3	有機酸				3												
4	醇類、二元醇類和酸類					4											
5	農藥、石棉等有毒物質						5										
6	鹽酸類							6									
7	胺、脂肪族、芳香族								7								
8	偶氮化合物、重氮化合物和聯胺									8							
9	水										9						
10	鹼											10					
11	氧化物、硫化物和氫化物												11				
12	二磺基過硫酸鹽													12			
13	醛類、醃類、酮類														13		

註一：易爆物包括溶劑、廢棄爆炸物、石油廢棄物等。
註二：強氧化劑包括鉻酸、氯酸、雙氧水、硝酸、高錳酸等。

說明

反應顏色	結 果
黃色	產生熱
粉紅色	起火
藍色	產生無毒和不易燃性氣體
紫色	產生有毒氣體
橘色	產生易燃氣體
綠色	爆炸
深綠色	劇烈聚合作用
深藍色	或許有危害性但不穩定

範 例

黃色	產生熱起火有毒性氣體
粉紅色	
紫色	

廢液之貯存除應考慮容器與廢液之相容性外，更應注意廢液間之相容問題，不具相容性之廢液應分別貯存。

Form: A090051810

List of The Lab Chemicals

School: _____

Unit: _____

Department (Institute) _____

The Lab (Workshop) _____

Date of Completion (YYYY.MM.DD): _____

Item	Chemical No.	Chemical Name	Other Names	SDS Index Code (CAS No.)	UN No.	Supplier	Storage Data				Chemical Hazard Classification	
							Location (cabinet)	Concentration (%)	State of substance	Storage Quantity		Quantity Unit
Example	A01	Ionic Strength Adjuster (ISA) for Ammonia	ISA for Ammonia/Cyanide	1310-73-2	1824	Taiwan Honor Precision	Center Table (room temperature)	-	Liquid	0.5	L	Class 1 substance corrosive to metals, Class 1A substance with skin corrosion/irritation, Class 1 substance with serious eye damage/eye irritation
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