

高雄醫學大學作業環境監測計畫

Kaohsiung Medical University

Workplace Environmental Monitoring Plan

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Passed by the 1st interim meeting of Environmental Protection, Occupational Safety and Health Committee in Academic Year 2020-2021

一、目的

Article 1 Purpose

係為實施作業環境監測時，掌握勞工作業環境實態與評估勞工暴露狀況，訂定本校作業環境監測計畫。

Kaohsiung Medical University (KMU) formulates the KMU Workplace Environmental Monitoring Plan to keep track of the actual working environment and assess workers' exposure status when implementing workplace environmental monitoring.

二、實施監測之作業場所

Article 2 Workplaces to be monitored

依據職業安全衛生法施行細則第 17 條第 2 項訂定作業環境監測計畫及實施監測之作業場所如下：

The Workplace Environmental Plan is formulated in accordance with Article 17, Paragraph 2 of the Enforcement Rules of the Occupational Safety and Health Act, and the workplaces to be monitored are:

(一) 設置有中央管理方式之空氣調節設備之建築物室內作業場所。

1. Indoor workplaces in buildings equipped with central air conditioning systems.

(二) 坑內作業場所。

2. Workplaces inside tunnels.

(三) 顯著發生噪音之作業場所。

3. Workplaces that emit noticeable noises.

(四) 下列作業場所，經中央主管機關指定者：

4. The following workplaces designated by the central competent authority:

1. 高溫作業場所。

(1) Workplaces with high temperature

2. 粉塵作業場所。

(2) Workplaces that generate dust

3. 鉛作業場所。

(3) Workplaces that carry out lead work

4. 四烷基鉛作業場所。

(4) Workplaces that carry out tetra-alkyl lead work

5. 有機溶劑作業場所。(附表一)

(5) Workplaces that manufacture or handle organic solvents (see Table 1)

6. 特定化學物質作業場所。(附表二)

(6) Workplaces that manufacture or handle specific chemical substances (see Table 2)

7. 甲醛作業場所。

(7) Workplaces that manufacture or handle formaldehyde

(五) 其他經中央主管機關指定公告之作業場所。

5. Other workplaces designated and announced by the central competent authority.

3、權責單位 (附表三)

Article 3 Responsible units (see Table 3)

(一)環保暨安全衛生室—職業安全管理人員

1. Office of Environmental Protection – occupational safety and health management officer

於建立作業環境監測計畫（含採樣策略）前應由職業安全管理人員、現場主管、與委託外聘之執業工礦（職業）衛生技師成立「作業環境監測小組」。作業環境監測小組應能發揮以下任務：

Before establishing a Workplace Environmental Monitoring Plan (including sampling strategies), the occupational safety and health management officer, the site supervisor, and a contracted practicing mining (occupational) health technician shall form a Workplace Environmental Monitoring Team. The Occupational Environmental Monitoring Team shall be able to perform the following tasks:

1. 決定作業環境監測目的、暴露管理目標；

(1) Determine the workplace environmental monitoring goal and the exposure management objective;

2. 規劃與執行作業環境監測工作；

(2) Plan and execute the workplace environmental monitoring work;

3. 作業環境監測結果的檢討；

(3) Review the workplace environmental monitoring results.

(二)工作場所負責人：掌握勞工對於化學品的暴露實態，提供勞工安全無虞的工作場所。

2. Officer-in-charge of the workplace: Understand the actual status of workers' exposure to chemicals, and provide a safe workplace for workers.

(三)現場主管：提出作業環境監測需求及確定受測人員。

3. Site supervisor: Identify the workplace environmental monitoring needs and determine persons to be tested.

(四)受測人員：配合作業環境監測人員的指示進行採樣。

4. Test subjects: Perform sampling according to the instructions of the workplace environmental monitoring personnel.

(五)作業環境監測機構：委由執業之工礦（職業）衛生技師或勞動部認可之作業環境監測機構實施作業環境監測，說明採樣時暴露者應注意事項，及實際進行作業環境監測工作。

5. Workplace environmental monitoring agency: A practicing mining (occupational) health technician or a Ministry of Labor-recognized workplace environment monitoring agency shall be entrusted to implement workplace environmental monitoring, explain the precautions for individuals being exposed during sampling, and carry out the actual workplace environmental monitoring work.

4、作業環境監測小組規劃之作業環境監測計畫應包含

Article 4 The Workplace Environmental Monitoring Plan devised by the Workplace Environmental Monitoring Team shall include

(一)危害辨識及資料收集

1. Hazards identification and data collection

(二)相似暴露族群之建立

2. Establishment of similar exposure groups (SEGs)

(三)採樣策略之規劃及執行

3. Planning and execution of the sampling strategies

(四)樣本分析。

4. Sample analysis

(五)數據分析及評估。

5. Data analysis and evaluation

5、計畫定期實施與查核

Article 5 Regular implementation and audits of the plan

(1) 作業環境監測小組應依照法令規定，定期實施作業環境監測，於每次監測完時應自我查核，檢討要項包含：

1. The Workplace Environmental Monitoring Team shall implement workplace environmental monitoring regularly according to the law and regulations. After each monitoring session, the team shall perform a self-audit, and the review shall include:

1. 作業環境監測政策、目的

(1) The workplace environmental monitoring policy and goal

2. 基礎資料蒐集

(2) Collection of basic information

3. 作業環境監測規劃制定

(3) Formulation of the workplace environmental monitoring plan

4. 作業環境監測執行數據處理、保存及後續改善

(4) Execute data processing, storage, and follow-up improvement for workplace environmental monitoring

5. 其他

(5) Other

六、收集歷年作業環境監測資料，除留存備查外，並將歷年環測結果，與健康檢查資料作比對，對於健康檢查異常的對象，分析是否與工作環境有關聯性，並作為下一次的採樣規劃的參考事項。

Article 6 Collect historical workplace environmental monitoring data, retain it for reference, and compare the historical environmental monitoring results with health examination data. For those with abnormal health check results, analyze whether there is a correlation with the work environment and make it a reference for planning the next sampling.

七、本計畫經環保暨職業安全衛生委員會審議通過後，自公布日起實施，修正時亦同。

Article 7 This Plan shall be reviewed and passed by the Environmental Protection, Occupational Safety and Health Committee and then implemented on the date of promulgation and shall apply to subsequent amendments.

附表一 製造、處置或使用有機溶劑之作業場所應實施作業環境監測之項目一覽表

Table 1 List of Environmental Monitoring Items to be Implemented on Workplaces that Manufacture, Handle or Use Organic Solvents

分類 Classification	有機溶劑名稱 Name of organic solvents
第一種 有機溶劑 Class 1 organic solvents	1.三氯甲烷 Chloroform 2.1.1.2.2.-四氯乙烷 1,1,2,2-Tetrachloroethane 3.四氯化碳 Carbon tetrachloride 4.1.2.-二氯乙烯 1,2-Dichloroethene 5.1.2.-二氯乙烷 1,2-Dichloroethane 6.二硫化碳 Carbon disulfide 7.三氯乙烯 Trichloroethylene
第二種 有機溶劑 Class 2 organic solvents	1.丙酮 Acetone 2.異戊醇 Isoamyl alcohol 3.異丁醇 Isobutyl alcohol 4.異丙醇 Isopropyl alcohol 5.乙醚 Ethyl ether 6.乙二醇乙醚 Ethylene glycol diethyl ether 7.乙二醇乙醚醋酸酯 Ethylene glycol ethyl ether acetate 8.乙二醇丁醚 Ethylene glycol butyl ether 9.乙二醇甲醚 Ethylene glycol methyl ether 10.鄰-二氯苯 o-Dichlorobenzene 11.二甲苯 Xylene 12.甲酚 Cresol 13.氯苯 Chlorobenzene 14.乙酸戊酯 Pentyl acetate 15.乙酸異戊酯 Isoamyl acetate 16.乙酸異丁酯 Isobutyl acetate 17.乙酸異丙酯 Isopropyl acetate 18.乙酸乙酯 Ethyl acetate 19.乙酸丙酯 Propyl acetate 20.乙酸丁酯 Butyl acetate 21.乙酸甲酯 Methyl acetate 22.苯乙烯 Styrene 23.1.4.二氧陸圜 1,4-Dioxane 24..四氯乙烯 Tetrachloroethylene 25.環己醇 Cyclohexanol 26.環己酮 Cyclohexanone 27.1.-丁醇 1-Butanol 28.2.-丁醇 2-Butanol 29.甲苯 Toluene 30.二氯甲烷 Dichloromethane 31.甲醇 Methanol

	32. 甲基異丁酮 Methyl isobutyl ketone
	33. 甲基環己醇 Methyl cyclohexanol
	34. 甲基環己酮 Methyl cyclohexanone
	35. 甲丁酮 Methyl butyl ketone
	36.1.1.1.-三氯乙烷 1,1,1-Trichloroethane
	37.1.1.2.-三氯乙烷 1,1,2-Trichloroethane
	38. 丁酮 Butanone
	39. 二甲基甲醯胺 Dimethylformamide
	40. 四氫呋喃 Tetrahydrofuran
	41. 正己烷 n-Hexane

附表二 製造、處置或使用特定化學物質之作業場所應實施作業環境監測之項目一覽表
Table 2 List of Environmental Monitoring Items to be Implemented on Workplaces that Manufacture, Handle or Use Specific Chemical Substances

分類 Classification	特定化學物質名稱 Name of specific chemical substances
甲類物質 Category A substances	1.聯苯胺及其鹽類 Biphenylamine and its salts 2.4-胺基聯苯及其鹽類 4-Aminobiphenyl and its salts 3.β-萘胺及其鹽類 β-Naphthylamine and its salts 4.多氯聯苯 Polychlorinated biphenyls 5.五氯酚及其鈉鹽 Pentachlorophenol and its sodium salt
乙類物質 Category B substances	1.二氯聯苯胺及其鹽類 Dichlorobenzidine and its salts 2.α-萘胺及其鹽類 α-Naphthylamine and its salts 3.鄰-二甲基聯苯胺及其鹽類 o-Dimethylaniline and its salts 4.二甲氧基聯苯胺及其鹽類 Dimethoxyaniline and its salts 5.鈹及其化合物 Beryllium and its compounds
丙類 第一種物質 Category C Class 1 substances	1.次乙亞胺 Ethyleneimine 2.氯乙烯 Vinyl chloride 3.丙烯腈 Acrylonitrile 4.氯 Chlorine 5.氰化氫 Hydrogen cyanide 6.溴甲烷 Methyl bromide 7.二異氰酸甲苯 Toluene diisocyanate 8.碘甲烷 Methyl iodide 9.硫化氫 Hydrogen sulfide 10.硫酸二甲酯 Dimethyl sulfate 11.苯 Benzene 12.對-硝基氯苯 p-Nitrochlorobenzene 13.氟化氫 Hydrogen fluoride
丙類 第三種物質 Category C Class 3 substances	1.石棉 Asbestos 2.鉻酸及其鹽類 Chromic acid and its salts 3.砷及其化合物 Arsenic and its compounds 4.重鉻酸及其鹽類 Chromium trioxide and its salts 5.鎘及其化合物 Cadmium and its compounds 6.汞及其無機化合物 Mercury and its inorganic compounds 7.錳及其化合物 Manganese and its compounds 8.煤焦油 Coal tar 9.氰化鉀 Potassium cyanide 10.氰化鈉 Sodium cyanide 11.鎳及其化合物 Nickel and its compounds
丁類物質 Category D substances	硫酸 Sulfuric acid

附表三 權責單位成員職責之說明

Table 3 Duty Description of Members of the Responsible Units

職 稱 Job title	姓 名 Designation	職 責 Duties
工作場所負責人 Officer-in-charge of the workplace	雇 主 Employer	1.掌握勞工對於化學品的暴露實態。 Keep track of the actual status of workers' exposure to chemicals. 2.提供勞工安全無虞的工作場所。 Provide a safe workplace for workers.
職業安全管理人員 Occupational safety and health management officer	職業安全管理人員 Occupational safety and health management officer	1.評估廠內危害並進行作業特性調查，擬定及執行作業環境監測計畫。 Assess hazards in the factory and carry out work characteristics survey; formulate and execute the Workplace Environmental Monitoring Plan. 2.提出採樣規劃。 Propose a sampling plan. 3.作業環境監測工作協調及管理。 Coordinate and manage the workplace environmental monitoring work. 4.監測過程定期查核。 Regularly audit the monitoring process. 5.監測結果之評估與提議改進措施。 Evaluate the monitoring results and propose improvement measures. 6.記錄保存。 Keep records.
採購人員 Procurement officer	職業安全管理人員 Occupational safety and health management officer	作業環境監測委外工作之採購、簽約與付款。 Procurement, contract signing, and payment for outsourcing the workplace environmental monitoring work.
現場主管 Site supervisor	實驗單位負責人 Officer-in-charge of the experimental unit	1.提出作業環境監測需求。 Identify the workplace environmental monitoring needs. 2.提供現場相關資訊。 Provide site-related information. 3.確定受測人員。 Determine personnel to be tested. 4.採取改進措施。 Adopt improvement measures.

<p>勞工代表 Labor representative</p>	<p>實驗單位代表人 Representative of the experimental unit</p>	<p>1.提出作業環境監測需求。 Identify the workplace environmental monitoring needs. 2.監督監測工作之執行。 Supervise the execution of monitoring work.</p>
<p>勞動部認可之監測機構 Ministry of Labor- recognized monitoring agency</p>	<p>委外監測機構 Contracted monitoring agency</p>	<p>1.受委託執行各項監測工作。 Entrusted to execute various monitoring tasks. 2.監測目標（人員或地點）工作特性之評估。 Evaluate the work characteristics of the monitoring targets (personnel or locations). 3.提供專業諮詢。 Provide professional consultation service.</p>