



文件名稱 : Restriction of Hazardous Substances Management Procedure

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| 郭欣怡         | 張文銘       | 歐正明         | 94 年 3 月 1 日 |

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環隆科技股份有限公司

UNIVERSAL MICROELECTRONICS CO., LTD.

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### 1.0 Purpose：

In order to comply with the requirements of multinational laws and regulations to prevent the UMEC green products mixed with hazardous substances. UMEC Group release this procedure for hazardous substances management, include supplies cooperation and commitment to the regulations, protect the global environment and reduce halogens influence upon the eco-system.

### 2.0 Scope:

- 2.1 Suppliers of raw materials, semi-finished goods, finished goods, sub-materials, packaging materials. (including outsourcers)
- 2.2 UMEC Group develop their own design, manufacture, sale or maintenance of GP products.
- 2.3 The GP products which are authorized by customers for UMEC Group to design, manufacture, sale or repair.

Above are required to meet the standard requirements of HSF technology. Customer's special designation shall prevail and follow up.

### 3.0 Description

#### 3.1 Definition

- ※ UMEC Group：refers to Universal Microelectronics Co., Ltd., including its subsidiaries (plants) and branches (plants)
- ※ **GP**: Green Product.
- ※ **RoHS**: Restriction of Hazardous Substances Directive (2011/65/EU) & 2015/863 EU
- ※ **Lead-free**: Definition as HSF
- ※ **Lead**: Definition as HS
- ※ **HS**: Hazardous Substances refers to the international environmental laws restricted substances (Ex RoHS), as well as any customer additional requirements prohibit use of restricted substances.
- ※ **HSF**: Hazardous Substances Free refers to the reduction or elimination of the table WEEE and RoHS Directive, as well as other applicable standards or regulations of any material reduction or exclusion, see attached 7 "environmental chemicals management schedule "
- ※ **HF**: Halogen Free
- ※ **HSF sub-tier**：HSF materials and parts supplier, including, but not limited to the HSF suppliers supply providers, outsourcers, agents.



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- ※ **Parts**: listed in the BOM and UMEC products with limited functional parts (such as electronic parts, Mechanical Parts, semiconductor elements, printed circuit boards, etc.).
- ※ **Sub-materials (indirect materials)**: not listed in the BOM, but should be used when manufacturing HSF product and accompanied the product to the customer items (such as packaging materials, packaging components, strapping, plastic bags, tape, etc.) or consuming goods used for manufacturing process and equipment which may have direct contact with parts, semi-finished goods and finished goods of products (eg: alcohol. Lubricants. gloves, etc.).
- ※ **High-risk materials**: Recycled resin, wire, enameled wire (not included), the appearance of the material, CABLE, CASE ,PCB, lead-free solder.
- ※ **HSF test report**: By UMEC identified third party or testing agencies ( the ISO / IEC 17025 certification laboratory) issued no hazardous substances test report. (The test report must contain the following information: name of the inspection unit, product names, pre-treatment methods, test methods, measurement name, date of testing, flow charts, test results etc.)
- ※ **High-risk materials**: Recycled resin, wire, enameled wire (not included), the appearance of the material, CABLE, CASE ,PCB, lead-free solder.
- ※ **Green Partner**: The supplier meets UMEC HSF requirements or customers HSF requirements and designated by customers.

### 3.2 Management levels : Control by three levels

Level 1 : The substances and purposes classified at this level are those whose use must be banned immediately.

Level 2 : The substances and purposes classified at this level are those for which periods for phase-out are individually set. On or after the date set in each table, the substances in the respective table must not be contained in modules, parts, sub-materials, and materials and will be classified at Level 1.

Level 3 : No periods or targets for reduction are currently set for the substances and purposes classified at this level. However, the contents of the substances in parts and materials ought to be reduced in future designated plan.

Exemption: The material which not subject to regulation can still use in the product.



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**3.3 Contained** : "Contained" is a situation in which a substance is added to, fills up, mingles with, or adheres to the parts or devices employed in products, or the materials used for the parts or materials ought to be reduced.

**3.4 Impurity** : An "Impurity" is a substance that satisfies either or both of the following conditions : A substance contained in a natural material, which cannot technically be removed in a refining process totally and a substance generated in a synthesis process, the total removal of which is technically impossible.

3.5 UMEC shall comply with this standard to develop new products from MAR.01.2005.

3.6 UMEC shall complete engineering changes for all on-going production products to comply with this standard before JAN.01.2006.

3.7 UMEC supplier shall only deliver products complying with HSF requirement.

3.8 Implement with project management when customer has special needs.

3.9 UMEC use a G code to identify the RoHS compliancy materials and products, for example, 10-xxxxx means non-RoHS materials, 10G-xxxxx means RoHS materials, TR-xxxxx means HS Transformer, TG-xxxxx means HSF transformer.  
H represent Halogen free products, for example TH-xxxxx means Halogen free Transformer.

#### 4.0 Reference documents :

2013/2/EU (packaging materials and packaging waste directive), 2011/65/EU & 2015/863 EU Directive (ROHS Directive), Directive 2012/19/EU (WEEE Directive), 2013-56-EU (Battery Directive), 412/2012 EU Directive (DMF Directive), Prohibition of Certain Toxic Substances Regulations, 2012, Perfluorooctane sulfuric acid Directive (2006/122/EC), Montreal, destroy the ozone layer  
Protocol on Substances, Japan J-MOSS, China RoHS, Reach EU chemicals registration, assessment, Authorization and Restriction of regulatory directives and other international environmental laws and regulations, Sony SS-00259 update version



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## 5.0 Procedure

### 5.1 Responsibility :

Top management person (general manager) authorized management representatives convened to RD, engineering, procurement, marketing, QA, production control, production, warehousing established a Restricted Substances Committee, to promote the limited material operating plans.

To discuss and reach customers environmentally hazardous substances management requirements, and everyone understands HSF most new situation.

#### 5.1.1 President :

- a. UMEC president commit to train all employees the RoHS directive.
- b. UMEC president commit to follow the regulations and customer's requirements to control the hazardous substances.

#### 5.1.2 Purchasing :

- a. Suppliers are required to upload the "Warranty for Non-use of hazardous substances" (ANNEX 1) and the third-party test report & ingredient list valid for one year into the GPM system.
- b. Notify R&D take action for supplier unable to supply certificate.
- c. Notify and update supplier for this procedure.
- d. RD needs to ask supplier provide the HSF test report when new component approved  
The reference document is D00-PR-001.
- e. Responsible for purchasing HSF and meet customer requirements.

#### 5.1.3 Production control :

Control stock status and HSF transition and outsourcer management. Including gets HSF guarantee and provide one year validate third party test report.

#### 5.1.4 R&D :

- a. UMEC uses a new component on the self-developed product. RD needs to require suppliers to upload HSF test report data into the GPM system or commission procuring to require suppliers to upload it to the GPM system.
- b. When selecting a new component, it should meet UMEC's HSF needs, and PLM RoHS status shows PASS. ( reference document is D00-PR-001)



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- c. Other material and packing material also need meet the above requirement.
- d. The Material should follow PPAP procedure, except the material's spec and diagram, the supplier shall prepare HSF certificate, HSF BOM list and third party test report.
- e. Any special HSF request by customer shall follow up.

**5.1.5 Engineering :**

- a. Support production technology and introduce products which meet customer and HSF regulations.
- b. Define identification of semi-finished product, finished product and carton HSF label.

**5.1.6 QA:**

- a. Access and update regulations and customer's requirements.
- b. Implement incoming inspection, send uncertain materials to national certified LAB for testing.
- c. Revise and control this procedure.
- d. Supporting internal education training.
- e. Implement internal and external audit activity.
- f. To solve respective HSF issue.
- g. Implement XRF&PY-GCMS testing.
- h. GPM data review and management.

**5.1.7 Production :**

- a. Control and segregate HSF materials and products.
- b. Ensure that the process equipment and folder fixture used separately, and the prevention of pollution.
- c. To confirm part number distinguish and labeling.

Reference document is M00-PR-003

**5.1.8 RoHS engineer :**

- a. RoHS engineer assists the GPM level B.C supplier to upload and update HSF. (Including test report, declaration, ingredient list).
- b. System application supporting.

**5.1.9 Marketing :**

- a. Response customer requirement to related department.
- b. Provide HSF certificate for customer. Includes fill up on web site.
- c. Provide HSF compliance Products and approve sheet for customer approval.
- d. Provide third party HSF test report and approved sheet to customer if needs .
- e. Access and update when customer's HSF requirements input.



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**5.1.10 Management department：**

Planning and the implement regularly HSF education training, includes assessment information files.

**5.1.11 Warehouse:**

HSF material, finished goods receiving / release process identification and control and HSF nonconforming product control.

**5.1.12 Overseas sub-factory:**

Overseas sub Plant should refer to Q00-MA-004 Products Restricted Substances quality assurance management manual, special requests from customer shall response to EMR

**5.2 Document control：**

5.2.1 Restricted Substances Management changes timing:

"SONY SS-0259 technology standard [21]" or customer requirements or regulations, as well as industry-standard changes. QA will confirm the transaction and fill up and sent to the top environment representative , and run PLM to ensure pass the message to respective person and execute.

5.2.2 Supplier should provide：

1. Non use of hazardous substances certificate.
2. Test report issued by national certified test LAB.
3. material composition.

The above documents are uploaded to the GPM system by supplier, it is approved after the documents are reviewed by IQC.

5.2.2.1 When any department receives the supplier revised HSF information should transfer the information to component engineer and she or he should revise the supplier status in PLM system.

5.2.2.2 The supplier should provide the HSF information in electronic files. Except the company stamped certificate.

5.2.2.3 The other process refers to document control procedure (QOO-PR-001).





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### 5.3 Records control :

The RoHS records shall reserve 10 years. The other process refers to records control procedure. (Q00-PR-004)

### 5.4 Design control :

In order to comply with environmental laws around the world and customers green requirements, development of new products subject to UMEC HSF Request

#### 5.4.1 Never use level 1 hazardous substances.

- a. Never use level 1 hazardous substances in new design products.
- b. New approved HSF parts needs "prohibit level 1 of an environmental management substances" mark to be added in the material specifications (as shown below), or other identifiable

禁止使用1級  
環境管理物質

#### 5.4.2 HSF design and development planning

- a. HSF suppliers shall plan and control when development and the scope include (1) the prohibition use of the substance, (2) plans to cancel the substance, and (3) reduction of the substances, the use of any hazardous substances should be recorded, and replace harmful substances in parts, materials to meet the future demand. (Refer to E00-ST-004 Annex 4 classification of hazardous substances)
- b. Pb and other substances exemption before the expiration :
  - (1) confirmation of the validity period of the exemption;
  - (2) Positive development of alternative materials, with reference to a valid exemption before the expiration of the relevant raw materials phase-out.
  - (3) If no replacement is prior to the expiration of the exemption clause, through appropriate channels, to the Official Journal of the European Union apply for extension of the exemption period

#### 5.4.3 HSF parts, sub-materials selection:

- a. Subject to the UMEC E00-ST-004 Restricted Substances Management Specification Annex 4 classification of harmful substances "and" attached Requirements of part 7 - Environmental chemicals management schedule "
- b. Material detected by third party notary with HSF demand, data and issue guarantee.
- c. If supplier are unable to provide third party test report, guarantee and no substitutes, then it still can use after XRF instrument detection qualified and recognized by the Company EMR.



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5.4.4 After 2018.6.1, the Purchasing needs to request that the A-level suppliers for applying a new material number need to fill in the RoHS information on the GPM system. The R&D and Engineering assist the B-level & C-level suppliers to upload the HSF-related information collection. Quality Assurance reviews the information correctness, and then aggregate the HSF information to customers to meet customer HSF needs..

5.4.5 The new material application department of UMEC proposed that the purchasing needs to request the suppliers to fill in the HSF-related information on the GPM system, such as submitting a third-party test report valid for one year, guarantee, declaration, MSDS or ingredient list.

In addition, the "review status" of the PLM system HSF restricted substance shows "PASS" before the MA (parts approved recognition) process can be run.

The "specified status" field of the HSF restricted substance in the GPM system is normally marked to distinguish the following four types.

1. **RoHS 2.0** :stands for UMEC RoHS standard.。
2. **RoHS 2.0\_Ctrl** :means that it does not meet the requirements of the UMEC HSF, but it meets the requirements of the customer and related environmental laws and regulations, and notes the substance (including PVC material)
3. **HF**: halogen-free" standard (RoHS 10 items + Br, Cl = 12 items)
4. **HF\_Ctrl**: means that it does not meet the UMEC halogen-free current requirements, but meets the requirements of the customer and related environmental laws and regulations, and notes the substance (including PVC material).

Control HSF details, refer to Annex 4 to the classification of hazard substances "and" Annex 7 - management of environmental chemicals detailed sheet "

5.4.6 HSF components, sub-materials, materials required to reach UMEC standard. And ask HSF sub-tier supply data (such as test reports, guarantee, MSDS or ingredients)and shall provide level 3 material with no hazard substances if necessary.

5.4.7 HSF parts should be added to temperature withstanding standard if SMT reflow and the DIP wave-soldering process or heat-resistant has safety considerations.



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5.4.8 HSF design phase should review HSF planning and documented.

- 1) Should review the plan to ensure that the design and development of the HSF materials and parts verification, and documented.
- 2) No hazard substances material proof of HSF materials and parts in approved sheet.
- 3) Should confirm that you selected specified raw materials in accordance with the Green Partner supplier.

5.4.9 Others reference to Q00-PR-018 (design control procedures)

### 5.5 Purchasing control :

5.5.1 The purchasing department should ensure that all purchased parts, auxiliary materials, packaging materials must comply with HSF requirements. HSF related requirements should be clearly marked on the purchase order, to facilitate the suppliers with the implementation.

5.5.2 Supplier selection:

The following are supplier selection guidance:

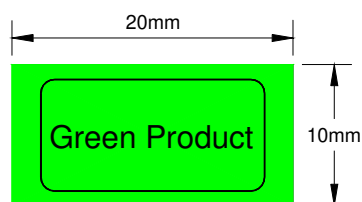
a. The Assigned materials:

Only could be purchase from the Green Partner of UMEC or Customer approved Green Partner.

b. All other materials:

Should purchase from the supplier who follow this procedure specified.

5.5.3 The parts or materials should have sticked "GREEN PRODUCT" green color label on the packaging. This is an acceptance criterion during incoming inspection. The reference label format is as following.



5.5.4 Provide information to suppliers:

UMEC should update and pass the document of "E00-ST-004 products restricted substances management procedure" to the supplier, and ask sign back or returned the receipts by e-mail (The others please reference A00-PR-031 communication management procedure)



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### 5.5.5 GP supplier management:

Supplier shall comply with the following requirements and implemented.

**(1) Be instructed management standards and confirm the commitment.**

Suppliers should be in accordance with the document of E00-ST-004 "Restricted Substance Management procedure", includes attachment 4 "classification of hazard substances and attachment 7" environmental chemicals management list" and confirm commitment.

**(2) Shall provide measured data:**

For procurement of new parts of OEM products, new materials or outsourcing products, the supplier should provide the following information prior to order release:

A. No using guarantee of environmental management substances.

B. the ingredients table (or three years MSDS).

C. 1 years test report.

In special situation, suppliers can not provide the third impartial test report and guarantee, but can pass XRF detect. It still can use after recognized by EMR.

When change occurred in materials, processes, places or UMEC customers ask 1 year test report, then supplier is obliged to provide 1 year re-test report to meet customer demand.

**(3) Management equipment, clip fixture:**

The supplier should make their own assessment lists of equipment and clip fixture to identify no pollution, and establish traceability system.

**(4) To establish the products environmental quality assurance system:**

Evaluation of the production environment quality assurance system is necessary, include major suppliers or product environmental has quality concerns or high risk materials (such as recycled resin / wire) which shall be planning and implementation annually on-site audit.

For details, please refer to the B40-PR-002 "supplier management procedure.

### 5.6 Engineering change control :

5.6.1 It should re-confirm by RD when suppliers change of material operating method, the equipment or the operating environment. And the component engineer also needs to confirm HSF test report, and can be changed after approved.



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5.6.2 When the material change is related to customer products. The RD engineer shall notify customer with the necessary documents (Warranty, Test report or MSDS ) and get approval before implement change.

5.6.3 If the vendor / outsourcer has changes and affects the quality, supplier needs apply for approval. The process refers to D00-PR-001 “parts approved procedure”.

5.6.4 Others please refer to R90-PR-005 “4M Change Management procedure”.

### 5.7 Production control :

5.7.1 To avoid non- HSF material mixed in manufacturing process, it must clearly define in HSF production line. Different sign as follows: (special case will separately define)

A. A label with green background identify HSF production areas, pattern shows below:



B. A label with yellow background identify HS production areas, pattern shows below:



5.7.2 During implementation HSF conversion process, it should be strictly controlled and no mixed to avoid contamination of equipment or material.

5.7.3 The HSF compliance materials lot no shall be recorded on material use records. The manufacturing order, lot no, quantity, date code or serial no shall be recorded on traveler ticket for traceability. And yellow color of traveler ticket is for HS product only.

5.7.4 HSF trolley identification, HS Product trolley with yellow travel ticket, HSF Product trolley with green travel ticket, others special define.

5.7.5 The related person which HSF implementation of the production and service providers should make sure to have appropriate training.

5.7.6 Other Operations Reference to

- a. M00-PR-003 (manufacturing operations management program)
- b. M00-PR-001 (process single issued by management procedures)
- c. E20-ST-017 (HSF Process Manufacturing Practice)
- d. M34-WI the -025 (SMT HSF management practices)



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### 5.8 Incoming control :

5.8.1 Identify the material has stick “HSF” label or other identification on the packaging when the material is HSF compliance. If no, then it must pass the XRF test.

5.8.2 IQC shall sampling test the hazardous substances by XRF equipment. The result shall meet HSF requirement. When test data is out of RoHS requirement. Segregate the material and send to SGS LAB for test and identification.

5.8.3 Other process refers to incoming inspection procedure (Q00-PR-011) and HSF incoming inspection document(Q10-EI-001).

### 5.9 Warehouse control :

It should establish effective warehouse management system to ensure HSF production and service provision to implement and be documented.

5.9.1 About HSF raw materials / semi / finished goods, should be recognized no harmful substances before acceptance and entry into the warehouse.

5.9.2 For non-conformance HSF materials and goods, identified a defective area and paste a "prohibit use “ label to segregate. (refer to 5.10.1 Nonconformance Control)

5.9.3 HSF materials (like 20GXXX)and HS materials (like 20-XXX) shall segregate into different storage area.

HSF identify with white character and green background, please refer to <5.7.1 Figure A>

HS identify with black character and yellow background , please refer to <5.7.1 Figure B>

5.9.4 Materials shall keep first-in/first-out and detailed records of release date and work order number. The records are required to be stored for tracking. (reference << records control procedures >>)

5.9.5 In accordance with the periodic inventory at least twice a year keep the material match with list. Production control department should report sluggish materials list every six months, and help deal with the slow-moving alternative use or resale (IQC help detect whether electrical HSF and other related requirements)



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5.9.6 If expiration, the company's environmental policies can not use or resale of sluggish materials, production control department required to fill "defect scrap ", if dull material amount too large needs timely reflect and processing, and tracking.

5.9.7 In response to regulations or customer HSF standards changes, the original acceptable material should not use in new HSF models without re-confirm. For long-term material in inventory, it also needs to follow up the above mention.

5.9.8 Other operation refers to the procedure of inventory management(B50-PR-010)

#### 5.10 Nonconformance control :

5.10.1 Nonconformance material shall be stick reject label and segregated in reject area. Label shows below:



5.10.2 When nonconformance happen. Trace previous lot of material or product, verify by XRF equipment. If nonconformance detected, issue nonconformance report and run NCR flow.

5.10.3 Non conformance product shall be identified and segregated. The possible nonconformance lot shall be verified and report to management representative.

#### 5.11 Corrective and preventive action :

The CAPA should expand to related products and series of products.

5.11.1 Incoming discrepancy :

- a. For incoming nonconformance, follow “Discrepancy Disposition procedure” (Q00-PR-015).
- b. Identify and segregate the sampling lot.



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- c. Trace the previous incoming lot and verify their quality.
- d. Collect the information to quality and related department manager, the quality manager shall verify the nonconformance.
- e. Evaluate the nonconformance and notify customer when necessary.
- f. IQC notify purchasing and supplier to stop shipping, the supplier shall cooperate UMEC to investigate root cause of nonconformance and take corrective action. The nonconformance shall be segregated.
- g. The nonconformance material shall be returned to supplier. Release the supplier shipment when corrective action was verified, use XRF test 3 continuous lot and verify the effectiveness of Supplier CAPA.

#### 5.11.2 Process discrepancy：

- a. For process nonconformance follow “Discrepancy Disposition Procedure”.
- b. Identify and segregate the sampling lot, trace the previous lot and verify their quality. When nonconformance was verified. Notify customer if necessary.
- c. Process nonconformance emergency action：
  - 1. Stop line, call engineering, material control, QA, and production for team meeting and make disposition.
  - 2. Investigate the nonconformance material, then identified and segregated.
  - 3. Trace product, identify and segregate.
  - 4. Recall the product which on the way to customer.
  - 5. Trace the stock product, identify and segregate.
  - 6. Check each step of process, verify root cause.
  - 7. Rework the nonconformance product and follow customer requirement.
- d. After team investigation, provide corrective and preventive action. After customer approval then release to production.
- e. The nonconformance related root cause, corrective and preventive action shall be noted to all related employees. Who should have the knowledge of serious of nonconformance and enhance quality capability.

#### 5.11.3 Customer nonconformance：

- a. Details follow “Product Service Procedure”.(B10-PR-003)





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- b. The business staff response the customer complain to QA and related department. QA identify the complain, and notify business staff to inform customer no product quality problem was found. When identify quality problem. QA shall trace related products and customer. QA call team meeting for investigation and verification. Provide oral report within 3 hours and release initial report within 24 hours and final report within 48 hrs.
- c. Stop production immediately. Identify nonconformance material was used. Segregate the material, work in process and recall on freight products. Prevent epidemic failure.
- d. Project team provide corrective and preventive action plan. QA release corrective action report to customer through business staff. Try our best effort to make customer satisfaction.
- e. Negotiate with customer for the dispose of nonconformance product.
- f. Segregate the nonconformance in warehouse. Production planning shall prepare, RoHS compliance materials for production and meet customer requirement.
- g. Scrap or rework the nonconformance related lot. The rework shall follow engineering issued work instruction. The nonconformance materials shall be segregated.
- h. QA shall audit the corrective and preventive action. The related operators and staff shall have the training of related knowledge. They shall know the seriously of the problem and know how to prevent it happen.

#### 5.11.4 The disposition on nonconformance of supplier's site

When any supplier's nonconformance was notified UMEC shall work with Supplier and provide countermeasure support, and

- a. Test and trace with part no. Such as different lot no or date code, identify the product's Quality.
- b. Notice our customer if any nonconformance was infected.
- c. Request suppliers to take emergency action, and stop shipping until release SCAR. The supplier shall co-operate UMEC to investigate root cause of nonconformance and take corrective action. The nonconformance shall be segregated.
- d. Request supplier take analysis and corrective action, test and isolated the nonconformance lot, insure the 3 continuous lot are accepted, otherwise terminate the supplier's qualification.
- e. Trace the in-process products and warehouse products, any nonconformance was found follow procedure 5.11.2and 5.11.3



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f. When identify quality problem. The environment representative of supplier shall report to UMEC IQC within 3 hours and release formal report within 24 hours.

g. Others follow “Discrepancy Disposition Procedure”.(Q00-PR-015)

### 5.12 Nonconformance Green Product control and traceability.

#### 5.12.1 Trace rule:

The nonconformance products should have lot no or series no and are traceable to the material's or part's lot no and process traveler and operator.

#### 5.12.2 Segregation and disposition:

The warehouse should isolate an area for the segregation of nonconformance green products and wait for decision by top management.

#### 5.12.3 Record:

Shall keep records of the identification, traceability, segregation and disposition of the nonconformance green products.

#### 5.12.4 Nonconformance report:

1. Issue nonconformance report when nonconformance green products were detected
2. Nonconformance shall report to management representative immediately.
3. The management representative shall oral report to customer within 3 hours and formal report within 24 hours.

### 5.13 Test report conformation:

The GP supplier shall provide evidence documentation to identify that their material s or parts are comply with the requirements of the procedure specified.

#### 5.13.1 Test objective:

The materials, parts and packaging materials which supplied to UMEC.

#### 5.13.2 Test frequency:

5.13.2.1 The test frequency shall be identified and specified in appropriate work instruction.

XRF sampling timing and cycle control, material risk divided into A, B, C three grades;



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**A Grade: Low risk**

The UMEC of GP qualified suppliers and pass 3 batches.

Test frequency: once with three months.

**B Grade: Medium risk**

Material has not been detected will be as B grade or testing failed and down grade from A to B grade.

Test frequency: each batch, and can be converted to Class A after pass three lot tests.

**C Grade: high risk**

High-risk materials including exterior materials, CABLE, CASE, PCB, lead-free solder, etc.

Test frequency: Each lot (can not convert to A, B)

**5.13.2.2 A.B level test frequency adjustment**

(1) Adjusted B to A grade:

B grade HSF materials pass 3 lots test

(2) Adjusted A to B grade:

Adjusted A to B grade immediately once one lot test failed.

**5.13.2.3 Raw materials recycled resin, wire, enameled wire (not included), any material change needs to re-test.**

**5.13.3 Test Site and equipment**

Incoming confirm by effective measuring device and method through UMEC and in accordance with the testing standards

(1) UMEC own Testing Equipment:

A. With own test equipment, and prior report to UMEC and recognized.

B. Use UMEC identity XRF, record shall include processing, testing methods, flowchart, test date and person.

(2) Consigned to external testing site:

Be verified for ISO 17025 laboratory and test report include name of the authority , device name, test Date, flowcharts, pre-treatment methods, test person.



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- A. UMEC owned device should fill in the test report with measuring device name and number were measured, date and tester name.
- B. Consigned to third party testing site, the report should fill in authority name, device name, test Date, flowcharts, pre-treatment methods, test person.

#### 5.13.4 The effectiveness of the test data

In order to ensure the reliable of the test data, there should have documented control procedure for the equipment operation and training.

- a. Supplier should keep the equipment maintenance and calibration record to ensure the testing effectiveness.
- b. The third party Lab shall be national certified.

Others refers to HSF material incoming inspection work instruction(Q10-EI-001)

#### 5.14 Education training:

GP suppliers should meet UMEC E00-ST-004 defined Including repair parts, sub-materials, materials, implementation include education training, and documented

##### 5.14.1 objects:

Implementation of education training for at least 1 hour per year which response to all employees about GP materials and parts production.

##### 5.14.2 clear eligibility

Product environmental quality assurance system should be clearly defined the qualifications of the person.

##### 5.14.3 Plan formulate and implement

- A. Clear defined the accreditation of environmental quality assurance system which needs education training, experience.
- B. Development of the plan for education training and implemented. The tutor source should be keep.

##### 5.14.4 Qualification Recognition

Based on the training or experience, identified the person in charge of the relevant product environmental quality assurance system

##### 5.14.5 implementation of records management

Implementation of training records on product environmental quality assurance system.



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5.14.6 Others refer to the procedure of education training(A00-PR-009)

**5.15 UMEC HSF update information post on website site :**

<http://www.umec.com.tw> please down load by self.

**6.0 Hazardous substances and regulations**

6.1 The national certified testing LAB as annex 2.

6.2 The hazardous substances as annex 3.

6.3 The classification, application and banned date of hazardous substances as annex 4.

6.4 The information of hazardous substances and it's compounds as annex 5.

6.5 The testing method of hazardous substances as annex 6.

6.6 The hazardous substances control list as annex 7.

**7.0 ANNEX**

7.1 Certificate of non use hazardous substances(annex 1)

7.2 Certificate of non use hazardous substances( UMEC china annex 1-1)

7.3 National certified testing laboratory(annex 2)

7.4 Environmental hazardous substances(annex 3)

7.5 Hazardous substances classification(annex 4)

7.6 Details of substances(annex 5)

7.7 Test methods of environmental hazardous substances(annex 6)

7.8 Hazardous substances control list(annex 7)

7.9 REACH Compliance Declaration((annex 8)

**8.0 Form**

8.1 ROHS environmental hazardous substances decompose content Tables (Q00-121-\*)

8.2 Materials Composition Declaration (MCD) Form (Q00-122-\*)

**Unless specified, suppliers are strongly encouraged to conduct products certification through the following laboratories approved by UMEC.**

**(Or obtain ISO17025 certified laboratory)**

除非另有指定，強烈建議供應商委託下列環隆/嘉隆認可之實驗室。

(或取得ISO17025驗證實驗室)。

**Taiwan recognized four { 1.) ~ 6.) }, China accepted 9 { 1.)~ 9.) }, See the following information:**

目前臺灣認可6家{ 1.)~6.) },中國大陸認可9家{ 1.)~9.) },詳見以下資料:

**Laboratory name/ Address /Contact person & number**  
實驗室名稱 /地址/聯絡人及編號

**1.) ITS ( Intertek Testing Services ) 全國公證檢驗股份有限公司**

台北市內湖區瑞光路423號8樓

Web:www.intertek-twn.com,www.itslabtest.com

陳祺雯小姐 Ext 227

Tel : 02-6602-2888

E-Mail queena.chen@intertek .com

**2.) ETC ( Electronic Testing Center ) 財團法人台灣電子檢驗中心**

333 桃園縣龜山鄉樂善村文明路29 巷8號 ( 林口工三工業區)

Web:www.etc.org.tw

孫秀鳳 小姐 hoho@etc.org.tw

陳元曼小姐yumaco@mail.greenelectronics.org.tw

TEL : (03) 328-0026ext 292 、291 、288

FAX: (03) 327-6176

**3.) SGS 台灣檢驗科技股份有限公司 台灣省台北縣五股鄉五股工業區五工路136-1 號**

136-1, Wu Kung Road, Wuku Ind.Zone,Taipei County, Taiwan

Web:www.sgs.com.tw

TEL: (02)2299-3279#3123

FAX: 886-2-22997859

**4.) BV (Bureau Veritas ) 立德國際商品試驗有限公司**

臺北市北投區中央南路2 段37 號

Web:www.bureauveritas.com.tw

TEL: (02) 2897 6158

FAX: (02) 2897 6258

**1.) Intertek 深圳天祥集團**

深圳市南山區蛇口南海大道南百盈醫療器械園A座5樓

聯繫人:常小姐

Tel :0755-26020193 ext: 6099

全國免費服務熱線:800 999 1338

**2.) SGS 通標技術服務有限公司(深圳分公司)**

深圳市福田區下梅林1街1號

聯繫人:簡文娟

TEL:0755-2532 8888 ext: 8829

FAX:0755-8319 7625

**3.) CTI 華測檢測有限公司**

深圳市寶安區70區鴻威工業園C棟

聯繫人:歐陽妮娜

TEL:0755-3368 1901

FAX:0755-3368 3385

**4.) BV (Bureau Veritas ) 立德國際公證香港有限公司**

深圳市南山區西麗鎮留仙大道紅花嶺工業區閩利達工業大廈B棟五樓

聯繫人:郭一凡

TEL: 0755-8343 4378

FAX: 0755-8600 0912

**5.) PONY 普尼測試集團(深圳實驗室)**

深圳市南山区创业路中兴工业城6栋

聯繫人:周艷

TEL:0755-2605 0909 EXT:649

FAX:0755-2606 8336

**6.) SMQ 深圳市計量質量檢測研究所**

深圳市寶安區民治街道辦民治大道民康路

聯繫人:冷琳莉

TEL:0755-2752 8252

FAX:0755-2752 8479

**7.) AOV 安姆特檢測機構華南區域**

深圳市大學城學苑大道(西麗鎮塘朗村)安姆特大廈

聯繫人:岳志民

TEL:0755-8600 8533

FAX:0755-8600 8282

# National accredited laboratories and the data / 國內認可實驗室資料

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## 5.) CTi (CENTRE TESTING INTERNATIONAL) 台灣華測檢測技術有限公司

桃園市蘆竹區南崁路二段9號5樓之6

Web: [www.cti-cert.com.tw](http://www.cti-cert.com.tw)

TEL: (03) 222 0721

FAX: (03) 222 1527

## 6.) TUV (TUV Rheinland Taiwan Ltd) 台灣德國萊因技術監護顧問股份有限公司

台北市八德路4段758號11樓

Web: [www.tuv.com](http://www.tuv.com) / [www.chn.tuv.com](http://www.chn.tuv.com)

TEL: (02) 2172 7000

FAX: (02) 2528 0018

## 8.) CEST 中國電子標準化研究所賽西實驗室

深圳市龙岗区布吉街道布澜路深港中海信科技园B区8楼

聯繫人: 胡岐芳

TEL: 0755-3328 9286

FAX: 0755-3328 9252

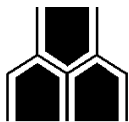
## 9.) HCT 深圳市虹彩检测技术有限公司

深圳市龙岗区龙平西路志达工业区鹏利泰工业园D栋

聯繫人: 王會

Tel: 0755-89982722

Fax: 4008266163-06189



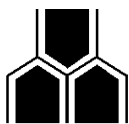
# 有害化學物質清單

## Environmental Hazardous Substances

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| 物質編號 | 英文名稱<br>Substances                 | CAS Number                         | 中文名稱                          | 法規來源<br>Regulation                        |
|------|------------------------------------|------------------------------------|-------------------------------|---|
| 1    | Lead and -compounds                | 007349-92-1                        | 鉛及其化合物                        | 2011/65 / EU<br>2015/863                  |
| 2    | Cadmium and -compounds             | 007440-43-9                        | 鎘及其化合物                        | 2011/65 / EU<br>2015/863                  |
| 3    | Mercury and -compounds             | 007439-97-6                        | 汞及其化合物                        | 2011/65 / EU<br>2015/863                  |
| 4    | Chromium (hexavalent) compounds    | 001333-82-0                        | 六價鉻及其化合物                      | 2011/65 / EU<br>2015/863                  |
| 5    | PBB, Polybrominated biphenyls      | e.g.<br>067774-32-7<br>059536-65-1 | 聚溴聯苯                          | 2011/65 / EU<br>2015/863                  |
| 6    | PBDE, Polybromodiphenyl ethers     |                                    | 聚溴聯苯醚                         | 2011/65 / EU<br>2015/863                  |
| 7    | phthalates (DEHP、DBP、BBP、DIBP)     |                                    | 鄰苯二甲鹽酸<br>(DEHP、DBP、BBP、DIBP) | 2015/863                                  |
| 8    | <b>Pb+Cd+Hg+Cr6</b>                |                                    | 鉛+鎘+汞<br>+六價鉻總含量              | 2004/12/EC 包材指令                           |
| 9    | Nickel and nickel compounds        | 7440- 02- 0                        | 鎳及鎳化合物                        | REACH Annex17 (27)<br>JIG-101<br>94/27/EC |
| 10   | TBBP-A, Tetrabromo Bisphenol-A     | 79-94-7                            | 四溴雙酚-A                        | 挪威PoHS                                    |
| 11   | Other brominated organic compounds |                                    | 其他有機溴化合物                      | 67/548/EEC                                |



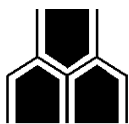


# 有害化學物質清單

## Environmental Hazardous Substances

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| 物質編號 | 英文名稱<br>Substances                     | CAS Number                         | 中文名稱             | 法規來源<br>Regulation                             |
|------|--|------------------------------------|------------------|--|
| 12   | PCBs, Polychlorinated Biphenyls        | 001336-36-3                        | 多氯聯苯             | REACH Annex17 (1)                              |
| 13   | PCN(Polychlorinated naphthalenes)      |                                    | 多氯化萘             | Stockholm Convention<br>EU POPs 2019/1021      |
| 14   | PCTs, Polychlorinated Terphenyls       | 061788-33-8                        | 多氯聯三苯            | REACH Annex17 (1)                              |
| 15   | CP, Short-chain Chlorinated Paraffins  | e.g.<br>010871-26-2                | 氯代烷烴             | JIG-101<br>2002/45/EC                          |
| 16   | Other chlorinated organic compounds    |                                    | 其他有機氯化物          | 97/10/EU                                       |
| 17   | Tributyl tin compounds                 | 000688-73-3                        | 三丁基錫化合物          | Japan law                                      |
| 18   | Triphenyl tin compounds                | 000892-20-6                        | 三苯基錫化合物          | Japan law                                      |
| 19   | Specific Azo compounds                 |                                    | 特定偶氮化合物<br>(22項) | REACH Annex17 (43)<br>2002/61/EC<br>2004/21/EC |
| 20   | Formaldehyde                           | 50-00-0                            | 甲醛               | US CARB  |
| 21   | PVC, Polyvinyl chloride and PVC blends | 9002-86-2                          | 聚氯乙烯,<br>聚氯乙烯混合物 | REACH Annex17 (2)<br>WEEE                      |
| 22   | EPS, Expanded Polystyrene              | 9003-53-6                          | 發泡聚苯乙烯           | Korea Law                                      |
| 23   | 1,1,1-Trichloroethane                  | 000071-55-6                        | 三氯乙烷             | Montreal Protocol                              |
| 24   | Carbon Tetrachloride                   | 000056-23-5                        | 四氯化碳             | Montreal Protocol                              |
| 25   | CFCs, Chlorofluorocarbons              | e.g.<br>000075-71-8<br>000076-13-1 | 氟氯碳化物            | Montreal Protocol                              |
| 26   | CHCs, Chlorinated Hydrocarbons         | e.g.<br>000075-34-3                | 碳氫氯化物            | Montreal Protocol                              |
| 27   | Chlorobromomethane                     | 000074-97-5                        | 氯溴甲烷             | Montreal Protocol                              |
| 28   | Halogenated Substances                 |                                    | 鹵化物              | IEC 61249-2-21                                 |
| 29   | Halons                                 | e.g.<br>000353-59-3<br>000074-97-5 | 海龍               | Montreal Protocol                              |

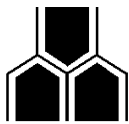


# 有害化學物質清單

## Environmental Hazardous Substances

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| 物質編號 | 英文名稱<br>Substances   | CAS Number  | 中文名稱                         | 法規來源<br>Regulation  |
|------|--|---|------------------------------|---|
| 30   | HBFC   | 1511-62-2   | 氟溴化合物                        | Montreal Protocol   |
| 31   | HCFCs, Hydrogenated Chlorofluorocarbons                                  | e.g.<br>000306-83-2   | HCFC冷媒                       | Montreal Protocol   |
| 32   | Aldrin   | 000309-00-2   | 艾氏劑                          | 斯德哥爾摩公約   |
| 33   | Bis (tri-n-butyltin) oxide (TBTO)  | 000056-35-9   | 三丁基氧化                        | 斯德哥爾摩公約   |
| 34   | Chlordane  | 000057-74-9   | 氯丹                           | 斯德哥爾摩公約   |
| 35   | Chlorophenothane   | 000050-29-3   | 滴滴涕                          | 斯德哥爾摩公約   |
| 36   | Dieldrin   | 000060-57-1   | 狄氏劑                          | 斯德哥爾摩公約   |
| 37   | Endrin   | 000072-20-8   | 異狄氏劑                         | 斯德哥爾摩公約   |
| 38   | Hexachlorobenzene  | 000118-74-1   | 六氯環己烷                        | 斯德哥爾摩公約   |
| 39   | Mirex, Perchlordecone  | 002385-85-5   | 滅蟻靈                          | 斯德哥爾摩公約   |
| 40   | N,N'-ditolyl-p-phenylenediamine, N-tolyl-N'-xylyl-p-phenylenediamine and |   | 苯二胺                          | 斯德哥爾摩公約   |
| 41   | Toxaphene  | 800-35-2  | 毒殺芬; 八氯茨烯                    | 斯德哥爾摩公約   |
| 42   | Beryllium oxide and Beryllium copper                                     | 304-56-9  | 氧化鈹, 鈹青銅                     | JIG-101   |
| 43   | phthalates (DINP、DIDP、DNOP、DNHP)   |   | 鄰苯二甲鹽酸 (DINP、DIDP、DNOP、DNHP) | REACH Annex17 (51)<br>REACH Annex17 (52)<br>JIG-101<br>Canada Law<br>TPCH |
| 44   | Hydrofluorocarbon(HEC),Perfluorocarbon(PFC)                              |   | 氫氟碳化合物(HEC),<br>全氟化碳(PFC)    | 蒙特婁公約   |
| 45   | Radioactive Substances   |   | 放射性物質                        | Japan law<br>JIG-101  |
| 46   | PFOS (Perfluorooctane sulfonates)  | 2795-39-3   | 全氟辛烷磺酸                       | REACH   |
| 47   | PFOA   | 335-67-1, 3825-26-1, 335-95-5, 2395-00-8, 335-93-3, 335-66-0, 376-27-2, 3108-24-5 | 全氟辛烷酸                        | 挪威  |
| 48   | POSF   |   | 全氟辛烷磺醯氟                      | Canada POPs<br>E00-ST-004   |

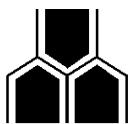


# 有害化學物質清單

## Environmental Hazardous Substances

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| 物質編號 | 英文名稱<br>Substances                                     | CAS Number                             | 中文名稱   | 法規來源<br>Regulation                                      |
|------|--|--|--|---|
| 49   | Specific Benzotriazole                                 | 3846-71-7                              | 特定苯并三唑                                       | Japan law   |
| 50   | Ugilec 141 (Tetrachlorodiphenyl methane)               | 76253-60-6                             | 單甲基四氯二苯基甲烷                                   | REACH   |
| 51   | Ugilec 121or C21 (Monomethyl dichlorodiphenyl methane) | 81161-70-8                             | 單甲基二氯二苯基甲烷                                   | REACH   |
| 52   | DBBT (Monomethyl dibromodiphenyl methane)              | 799688-47-8                            | 單甲基二溴二苯基甲烷                                   | REACH   |
| 53   | Br(Bromine)  | 007726-95-6                            | 溴  | IEC 61249-2-21  |
| 54   | Cl(Chlorine)   | 007782-50-5                            | 氯  | IEC 61249-2-21  |
| 55   | DMF ( dimethyl fumarate )                              | 624-49-7                               | 富馬酸二甲酯                                       | 412/2012  |
| 56   | PAHs   | 50-32-8、192-97-2 ....                  | 多環芳香烴  | REACH Annex17 (50)<br>2005/69/EC<br>Geprüfte Sicherheit |
| 57   | Cobalt dichloride                                      | 7646-79-9                              | 二氯化鈷   | REACH   |
| 58   | HBCDD<br>(Hexabromocyclododecane)                      | 3194-55-6                              | 六溴環十二烷                                       | REACH<br>挪威PoHS   |
| 59   | DBT  | 78-04-6                                | 二丁基錫化合物                                      | REACH   |
| 60   | DOT  | 15231-44-4                             | 二辛基錫化合物                                      | REACH   |
| 61   | Antimony(Sb)   | 7440-36-0                              | 銻以及銻化合物                                      | JIG-101   |
| 62   | Arsenic (As)   | 1327-53-3、<br>1303-28-2                | 砷  | REACH Annex17 (19)<br>JIG-101<br>2003/2/EC              |
| 63   | TCEP<br>TCPP<br>TDCPP                                  | 115-96-8,<br>13674-84-5,<br>13674-87-8 | 磷酸三(2-氯乙基)酯<br>磷酸三(2-氯丙基)酯<br>磷酸三(2,3-二氯丙基)酯 | REACH<br>美国·佛蒙特州·Act85                                  |
| 64   | Red Phosphorus / Yellow Phosphorus                     | 7723-14-0                              | 紅磷 / 黃磷                                      | JICOSH  |
| 65   | Benzene  | 71-43-2                                | 苯  | NIOSH<br>E00-ST-004                                     |

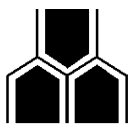


# 有害化學物質清單

## Environmental Hazardous Substances

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| 物質編號 | 英文名稱<br>Substances   | CAS Number  | 中文名稱                                     | 法規來源<br>Regulation   |
|------|--|---|--|--|
| 66   | n-Hexane   | 110-54-3  | 正己烷                                      | GBZ 2.1 2007<br>ACGIH  |
| 67   | Benzenamine, N-phenyl-,<br>reaction products with styrene and<br>2,4,4-<br>trimethylpentene(BNST)                          | 68921-45-9  | 苯乙烯和2,2,4-三甲<br>基戊烯的反應產物-<br>二苯胺         | Prohibition of Certain<br>Toxic Substances<br>Regulations,<br>SOR/2012-285 |
| 68   | Benzdine and benzdine<br>ihydrochloride that have the<br>molecular formulas<br>C12H12N2 and C12H12N2·<br>2HCl respectively |   | 聯苯胺和聯苯胺二<br>鹽酸鹽                          | Prohibition of Certain<br>Toxic Substances<br>Regulations,<br>SOR/2012-285 |
| 69   | Hexachlorobutadiene<br>(HCBD)  | 87-68-3   | 六氯丁二烯                                    | Prohibition of Certain<br>Toxic Substances<br>Regulations,<br>SOR/2012-285 |
| 70   | Toluene  | 108-88-3  | 甲苯                                       | ACGIH (2015)   |
| 71   | N-methylpyrrolidone (NMP)  | 872-50-4  | N-甲基吡咯烷酮N-<br>methylpyrrolidone<br>(NMP) | AIHA TWA<br>California OSHA  |
| 72   | Asbestos (all types)   | e.g.<br>001332-21-4<br>132207-32-0<br>132207-33-1 | 石棉                                       | US TSCA<br>REACH Annex17 (6)<br>91/659/EEC                                 |
| 73   | 2,4,6-tri-tert-butylphenol   | 000732-26-3                                       | 三叔丁基苯酚                                   | Japan Regulation<br>TSCA   |
| 74   | Pentachlorothiophenol (PCTP)   | 133-49-3  | 五氯苯硫酚                                    | TSCA   |
| 75   | Phenol, isopropylated phosphate<br>(3:1) (PIP3:1)  | 68937-41-7  | 異丙基化磷 酸三苯<br>酯                           | TSCA   |



# 有害化學物質清單

## Environmental Hazardous Substances

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| 物質編號 | 英文名稱<br>Substances                              | CAS Number | 中文名稱       | 法規來源<br>Regulation  |
|------|---|------------|------------|---|
| 76   | Long-chain perfluoroalkyl carboxylate (LCPFACs) |            | 長鏈全氟烷基羧酸鹽  | EPA   |
| 77   | perfluoroalkyl sulfonate chemicals(PFAS)        |            | 全氟烷基物質     | EPA   |
| 78   | Hexachlorobenzene (HCB)                         | 118-74-1   | 六氯苯        | POPs  |
| 79   | PCP(Pentachlorophenol)                          | 87-86-5    | 五氯酚        | EU POPs (EU) 2019/1021, 2021/277<br>Stockholm Convention                            |
| 80   | MOAH  |            | 礦物油芳香烴     | French law (Article 112 of Law n 2020-105)  |
| 81   | MOSH  |            | 礦物油飽和烴     | French law (Article 112 of Law n 2020-105)  |
| 82   | UV-328  | 25973-55-1 | 六紫外線吸收劑328 | Eighteenth meeting of the Persistent Organic Pollutants Review Committee (POPRC.18) |

Note:

- (1) N.D. = Not detected (< MDL) / 未檢出(低於偵測極限值)
- (2) ppm=mg/Kg
- (3) MDL = Method Detection Limit
- (4) “---“ = Not Applicable / 未測項目
- (5) “--“ = Not Test Method / 無測試方法
- (6) [ - ] =Negative=Undetectable / [ + ] =Positive=Detectable / \*\* = Qualitative analysis(No Unit)
- (7) Allowable concentration of lead and its compounds must less than 90 ppm under the application of paint, ink or stabilizer etc. in m:  
.Lead in glass of cathode ray tubes, electrical parts and vacuum fluorescent displays  
.Lead in electronic ceramic parts  
.Alloy : Steel (lead is less than 0.35 %), Aluminum alloy (lead is less than 0.4 %), Copper alloy (lead is than 4 %)

E00-ST-004

附件(ANNEX)3 REV.11

2023.08



# 有害化學物質清單

## Environmental Hazardous Substances

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| 物質編號 | 英文名稱<br>Substances | CAS Number | 中文名稱 | 法規來源<br>Regulation |
|------|--------------------|------------|------|--------------------|
|------|--------------------|------------|------|--------------------|

.Lead impurities contained in solder is than 1000 ppm.

(8) Mercury must not be contained in any materials, components, and products. But not apply to the followings :

.Mercury in compact fluorescent lamps not exceeding 5 mg per lamp.

.Mercury in straight fluorescent lamps for general purpose not exceeding :

Halophosphate 10 mg

Triphosphate with normal lifetime 5 mg

Triphosphate with long lifetime 8 mg

.Mercury in straight fluorescent lamps for special purpose

.Mercury in other lamps not specifically mentioned.

(1) All applications to use PVC in materials, components and products are prohibited except for cables.

(2) Remark “\*” for failed items.

### 允許排除項目：

某些規範之限用物質，若此一物質之特性，原就為了某些用途使用，在技術上或科學上替代是不實際的，無法以其他物質予以取代，或取代後形成環境/安全衛生之負面影響加重，以下訂定數項允許物質之應用與使用含量。

1. 圓形螢光燈管中之汞不超過每燈5mg。

2. 一般用途之直型螢光燈管不超過

鹵素磷酸鹽 10mg

三基磷酸鹽，正常壽命 5mg

三基磷酸鹽，長壽命 8mg

3. 特殊用途直型螢光燈管中之汞。

4. 上述未述及之其他燈管中之汞。

5. 陰極射線管、電子零件及螢光燈管之玻璃中含鉛量。

6. 鉛在

鋼中為合金含量最高0.35%鉛

鋁中最高0.4%鉛

銅合金中最高4%鉛

7. 錒錫中含鉛量，鉛在高融點溫度型之錒錫中（如錫-鉛焊料合金含85%鉛）。

8. 鉛在電子陶瓷零件上(如壓電裝置)。

9. 鍍鎳在91/338/EEC指令相關某些 危害物質及配置品之行銷與使用限制規定下除去其使用

10. 六價鉻用於吸收冷氣機碳鋼冷卻系統之防鏽



# Hazardous Substances Classification, Application and Banned Time

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## Cadmium and its compounds

| Level                                     | Targets   | Banned time        |
|---|---|--------------------|
| 1   | - Packaging parts (e.g. handle, cushions, wraps, foil, trays, reels, sticks)<br>(Refer to page11“Additional rules for packaging materials”) | Banned immediately |
|   | -Batteries parts<br>(Refer to page13“Applicable to all batteries in commercial distribution”)   |                    |
|   | - Plastics (including rubbers)<br>- Paints<br>- Inks - Paints, inks<br>- Solders (20 ppm max)<br>- Metal (50 ppm max)                       |                    |
|   | All applications other than the above   |                    |
| -The allowed concentration is Cd 5ppm Max |   |                    |

## Lead and its compounds

| Level | Targets   | Banned time        |
|-------|---|--------------------|
| 1     | - Packaging parts (e.g. handle, cushions, wraps, foil, trays, reels, sticks)<br>(Refer to page11“Additional rules for packaging materials”) | Banned immediately |
|       | -Batteries parts<br>(Refer to page13“Applicable to all batteries in commercial distribution”)   |                    |
|       | - Plastics (including rubbers)<br>- Paints<br>- Inks<br>-Core(Ferrite)  |                    |
|       | -The lead content of the soldering pin should not be higher than 800 ppm<br>(No Exemption)  |                    |
|       | -Solders Pb 800ppm Max  |                    |
|       | -All applications other than the above  |                    |



Lead and its compounds

| Level     | Targets   | Banned time |
|-----------|---|-------------|
| Exemption | <p>■6(a)-I Lead as an alloying element in steel for machining purposes containing up to 0.35 % lead by weigh.<br/>(Expiration on 2024/01/21*)</p> <p>■6(a)- II Lead as an alloying element in in batch hot dip galvanised steel components containing up to 0.2 % lead by weight.<br/>(Expiration on 2026/01/21*)</p> <p>■6(b)-I Lead as an alloying element in aluminium containing up to 0.4 % lead by weight, provided it stems from lead-bearing aluminium scrap recycling<br/>(Expiration on 2023/01/21*)</p> <p>■6(b)-II Lead as an alloying element in aluminium for machining purposes with a lead content up to 0.4 % by weight<br/>(Expiration on 2023/01/21*)</p> <p>■6(c) Copper alloy containing up to 4 % lead by weight.<br/>(Expiration on 2026/01/21*)</p> <p>■7(a) Lead in high melting temperature type solders (i.e. lead- based alloys containing 85 % by weight or more lead). (Expiration on 21 Jan 2024*)<br/>when used for the following applications (excludes those in the scope of exemption 24)</p> <p>-Applies for categories 1-7 (Expiration on 21 Jan 2026*)</p> <p>(1) For internal interconnections for attaching die, or other components along with a die in semiconductor assembly with steady state or transient/impulse currents of 0.1 A or greater or blocking voltages beyond 10 V, or die edge sizes larger than 0.3 mm x 0.3 mm</p> <p>(2) For integral (meaning internal and external) connections of die attach in electrical and electronic components, if the thermal conductivity of the cured/sintered die-attach material is &gt;35W/(m*K) AND the electrical conductivity of the cured/sintered die-attach material shall be &gt;4.7MS/m AND solidus melting temperature has to be above 260°C</p> <p>(3) In first level solder joints (internal or integral connections - meaning internal and external) for manufacturing components so that subsequent mounting of electronic components onto subassemblies (i.e., modules or sub-circuit boards or substrates or point to point soldering) with a secondary solder does not reflow the first level solder. This item excludes die attach applications and hermetic sealings</p> <p>(4) In second level solder joints for the attachment of components to printed circuit board or lead frames: a) in solder balls for the attachment of ceramic</p> |             |





|  |  |  |
|--|--|--|
|  | <p>ball-grid-array (BGA); b) in high temperature plastic overmouldings (&gt; 220 °C)</p> <p>(5) as a hermetic sealing material between: a) a ceramic package or plug and a metal case; b) component terminations and an internal sub-part</p> <p>(6) for establishing electrical connections between lamp components in incandescent reflector lamps for infrared heating or high intensity discharge lamps or oven lamps</p> <p>(7) for audio transducers where the peak operating temperature exceeds 200°C</p> <p>-7a (Expiration on 21 Jan 2024*).</p> <p>-7a(1)~7a(7) (Expiration on 21 Jan 2026*).</p> <p>■7(c)-1 Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound (Expiration on 2024/07/21*)</p> <p>■7(c)-V: Electrical and electronic components containing lead in a glass or glass matrix compound that fulfils the following functions: Applies for all categories (Expiration on 21 Jan 2026*).</p> <p>(1) protection and electrical insulation in glass beads of high voltage diodes and glass layers for wafer on the basis of a lead-zinc-borate or a lead-silica-borate glass body</p> <p>(2) for hermetic sealings between ceramic, metal and/or glass parts</p> <p>(3) for bonding purposes in a process parameter window for &lt; 500°C combined with a viscosity of 1013,3 dPas (so called “glass-transition temperature”)</p> <p>(4) used as resistance materials such as ink, with a resistivity range from 1 Ohms/square to 1 Mega Ohms/square, excluding trimmer potentiometers</p> <p>(5) used in chemically modified glass surfaces for Microchannel Plates (MCPs), Channel Electron Multipliers (CEMs) and Resistive Glass Products (RGPs).</p> <p>■7(c)-VI: Electrical and electronic components containing lead in a ceramic that fulfils the following functions (excluding items covered under item 7(c)-II, 7(c)-III and 7(c)-IV of this annex): Applies for all categories (Expiration on 21 Jan 2026*).</p> <p>1) piezoelectric lead zirconium titanate (PZT) ceramics</p> <p>2) providing ceramics with a positive temperature coefficient (PTC)</p> <p>Note: 【*】 means expiration date is UMEC’s policy, not by EU regulation</p> |  |
|--|--|--|



## Hazardous Substances Classification, Application and Banned Time

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-The allowed concentration is Plastics /ink/ Paints →Pb 90 ppm Max(Solder→Pb 800 ppm Max)



## Mercury and its compounds

| Level | Targets  | Banned time        |
|-------|--|--------------------|
| 1     | -Packaging parts (e.g. handle, cushions, wraps, foil, trays, reels, sticks)<br>(Refer to page11“Additional rules for packaging materials”)   | Banned immediately |
|       | -Batteries parts<br>(Refer to page13“Applicable to all batteries in commercial distribution”)  |                    |
|       | - All applications other than the above  |                    |
| 3     | - Mercury in cold cathode fluorescent lamps (CCFL) and external electrode fluorescent lamps (EEFL):<br>-Short length (not over 500 mm): Less than 3.5 mg of mercury per lamp<br>-Medium length (over 500 mm and not over 1500 mm): Less than 5 mg of mercury per lamp<br>-Long length (over 1500 mm): Less than 13 mg of mercury per lamp<br>- Mercury in high-pressure gas discharge lamps (e.g. projector lamps) |                    |

## Hexavalent chromium and its compounds

| Level | Targets  | Banned time        |
|-------|--|--------------------|
| 1     | -Packaging parts (e.g. handle, cushions, wraps, foil, trays, reels, sticks)<br>(Refer to page11“Additional rules for packaging materials”) | Banned immediately |
|       | -Batteries parts<br>(Refer to page13“Applicable to all batteries in commercial distribution”)  |                    |
|       | -Surfaces of screws, steel sheets, etc.that are processed with plating or conversion coating   |                    |
|       | - All applications other than the above  |                    |

## Nickel and its compounds

| Level | Targets  | Banned time        |
|-------|--|--------------------|
| 1     | -The use on external chassis/case parts and the use of frequently handled by the user to prevent the contact with human skin.(Nickel in stainless steel is not restricted)   | Banned immediately |
| 3     | All kinds of purposes except those classified in level 1, such as :<br>- Modules and parts inside the products<br>-Metallic nickel or nickel alloy using in outer surface treatment, and not for prolonged contact with skin. (e.g. screw, USB, plug, HDMI...etc.) |                    |



# Hazardous Substances Classification, Application and Banned Time

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-The allowed concentration is 1000PPM MAX.

## polybrominated biphenyls (PBBs)

| Level | Targets   | Banned time        |
|-------|---|--------------------|
| 1     | - All purposes (e.g. ones for the flame retardants contained in plastics) | Banned immediately |

## Polybrominated diphenylethers (PBDEs) including decabromodiphenyl ether(Deca BDE)

| Level | Targets   | Banned time        |
|-------|---|--------------------|
| 1     | - All purposes (e.g. ones for the flame retardants contained in plastics) | Banned immediately |

## Tetrabromobisphenol-A (TBBP-A)

| Level | Targets  | Banned time        |
|-------|--|--------------------|
| 1     | - All purposes (excluding PCB, IC package, wire and connector.). | Banned immediately |
| 3     | PCB, IC package, wire and connector.                             |                    |

## Hexabromocyclododecane (HBCDD)

| Level | Targets  | Banned time        |
|-------|--|--------------------|
| 1     | - All purposes (e.g. those for the flameretardants contained in EPS and PP). | Banned immediately |

## Brominated organic compounds (BFRs)

| Level | Targets | Banned time |
|-------|---------|-------------|
|-------|---------|-------------|



## Hazardous Substances Classification, Application and Banned Time

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|   |  |                    |
|---|--|--------------------|
| 1   | -External plastic parts of products and adhesives. Banned Immediately (e.g Case. Enclosure and stand of electronic displays) | Banned immediately |
| 3   | - Except those classified at "Level 1".  |                    |
| -The allowed concentration is 900PPM MAX. |  |                    |

### Polychlorinated Biphenyls (PCB) ,Polychlorinated terphenyls (PCT), polychlorinated naphthalenes (PCN)

| Level | Targets   | Banned time        |
|-------|---|--------------------|
| 1     | - All purposes (e.g. ones for capacitors, lubricants, insulating oils, transformers containing oil, and flame retardants contained in plastics) | Banned immediately |

### Chlorinated paraffin (CP) :Short-chain (SCCP) Medium-chain (MCCP)

| Level | Targets  | Banned time        |
|-------|--|--------------------|
| 1     | -All purposes (e.g. the external cases and PCBs of products) | Banned immediately |

### Polyvinyl chloride (PVC) and PVC blends

| Level | Targets   | Banned time        |
|-------|---|--------------------|
| 1     | All purposes except those classified at "Level 3" | Banned immediately |
| 3     | Wires(cables)                                     |                    |

### Cobalt dichloride

| Level | Targets  | Banned time        |
|-------|--|--------------------|
| 1     | - Moisture indicator used for a desiccant agent (e.g. silica gel)<br>- Humidity indicator card which is impregnated with cobalt dichloride | Banned immediately |

### Chlorinated Flame Retardants(CFRs)

| Level | Targets   | Banned time        |
|-------|---|--------------------|
| 1     | Enclosure and stand of electronic displays  | Banned immediately |
| 3     | All purposes( e.g. the flame retardants contained in plastics and used for PCBs). |                    |



# Hazardous Substances Classification, Application and Banned Time

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## Chlorinated Hydrocarbons

| Level                                      | Targets  | Banned time        |
|--|--|--------------------|
| 1  | All purposes (e.g. used in any other parts, components, materials or products, and other Chlorinated Hydrocarbons related substances). | Banned immediately |
| -The allowed concentration is 1000PPM MAX. |  |                    |

## List of the Chlorinated Hydrocarbons related substances

| CAS No.  | Amine compounds                          |
|----------|--|
| 75-35-4  | 1,1 Dichloroethylene                     |
| 76-01-7  | Pentachloroethane                        |
| 75-09-2  | Methylenechloride                        |
| 56-23-5  | Tetrachloromethane(Carbon Tetrachloride) |
| 630-20-6 | 1,1,1,2 Tetrachloroethane                |
| 79-34-5  | 1,1,2,2 Tetrachloroethane                |
| 127-18-4 | Tetrachloroethylene                      |
| 67-66-3  | Trichloromethane(Chloroform              |
| 79-00-5  | 1,1,2 Trichloroethane                    |
| 79-01-6  | Trichloroethylene                        |
| 71-55-6  | 1,1,1-Trichloroethane(TCA                |
| 542-88-1 | Bis (chloromethyl) ether                 |
| —        | Polychlorinated Phenols and their salts  |
| 75-01-4  | Vinyl Chloride (monomer)                 |

## Other chlorinated compounds

| Level | Targets  | Banned time        |
|-------|--|--------------------|
| 1     | Hexachlorocyclohexane isomers(HCH), Polychlorinated dibenzodioxins(PCDDs), Polychlorinated dibenzofurans(PCDFs) Tetrachlorobenzenes. | Banned immediately |



## Hazardous Substances Classification, Application and Banned Time

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|   |   |  |
|---|---|--|
| 3 | All purposes except those classified at “Level 1” |  |
|---|---|--|

Tributyltin compounds (TBT) and triphenyltin compounds (TPT) and Tributyl Tin Oxide(TBTO))  
Dibutyl tin compounds(DBT), Dioctyl tin compounds(DOT,

| Level | Targets  | Banned time        |
|-------|--|--------------------|
| 1     | -All uses (e.g. paints, inks, preservatives, and fungicides) | Banned immediately |

Asbestos

| Level | Targets                                   | Banned time        |
|-------|---|--------------------|
| 1     | - All purposes (e.g. insulators, fillers) | Banned immediately |

Azo Compounds

| Level | Targets   | Banned time        |
|-------|---|--------------------|
| 1     | -All purposes (e.g. belts, straps, ear phones, and head phones). Banned Immediately | Banned immediately |

List of specific amine compounds

| CAS No.  | Amine compounds        |
|----------|------------------------|
| 92-67-1  | 4-aminodiphenyl        |
| 92-87-5  | benzidine              |
| 95-69-2  | 4-chloro-o-toluidine   |
| 91-59-8  | 2-naphthylamine        |
| 97-56-3  | o-aminoazotoluene      |
| 99-55-8  | 2-amino-4-nitrotoluene |
| 106-47-8 | p-chroloaniline        |



## Hazardous Substances Classification, Application and Banned Time

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|          |   |
|----------|---|
| 615-05-4 | 2,4-diaminoanisole                        |
| 101-77-9 | 4,4'-diaminodiphenylmethane               |
| 91-94-1  | 3,3'-dichlorobenzidine                    |
| 119-90-4 | 3,3'-dimethoxybenzidine                   |
| 119-93-7 | 3,3'-dimethylbenzidine                    |
| 838-88-0 | 3,3'-dimethyl-4,4'-diaminodiphenylmethane |
| 120-71-8 | p-cresidine                               |
| 101-14-4 | 4,4'-methylene-bis-(2-chloroanilene)      |
| 101-80-4 | 4,4'-oxideaniline                         |
| 139-65-1 | 4,4'-thiodianiline                        |
| 95-53-4  | o-toluidine                               |
| 95-80-7  | 2,4-toluylenediamine                      |
| 137-17-7 | 2,4,5-trimethylaniline                    |
| 90-04-0  | o-anisidine                               |
| 60-09-3  | 4-aminoazobenzene                         |

Benzidine and benzidine dihydrochloride that have the molecular formulas C<sub>12</sub>H<sub>12</sub>N<sub>2</sub> and C<sub>12</sub>H<sub>12</sub>N<sub>2</sub>·2HCl, respectively

| Level | Targets             | Banned time        |
|-------|---------------------|--------------------|
| 1     | - All purposes<br>- | Banned immediately |

### Formaldehyde

| Level | Targets   | Banned time        |
|-------|---|--------------------|
| 1     | - All purposes (e.g. the wooden products made from fiberboard, particleboard, or plywood, which are employed in products, i.e. speakers, racks).<br>- | Banned immediately |

### EPS

| Level | Targets                         | Banned time        |
|-------|---------------------------------|--------------------|
| 1     | -All Packing Material For Korea | Banned immediately |





# Hazardous Substances Classification, Application and Banned Time

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|   |                           |  |
|---|---------------------------|--|
| 3 | -All Uses Except Level 1. |  |
|---|---------------------------|--|

## Ozone depleting substances

[Chlorofluorocarbons (CFCs), Halans, Carbon tetrachloride (CCl<sub>4</sub>), 1, 1,1-trichloroethane (C<sub>2</sub>H<sub>3</sub>Cl<sub>3</sub>), Bromochloromethane (CH<sub>2</sub>BrC), Methyl bromide (CH<sub>3</sub>Br), Hydrochlorofluorocarbons (HCFCs) and Hydrobromofluorocarbons (HBFCs)]

| Level | Targets  | Banned time        |
|-------|--|--------------------|
| 1     | - All purposes (e.g. cold matchmaker, vesicant for the packing materials, clean solvent) | Banned immediately |

## Radioactive substances

[Uranium (U), Plutonium (Pu), Radon (Rn), Americium (Am), Thorium (Th), Cesium (Cs), Strontium (Sr) and other radioactive substances]

| Level | Targets  | Banned time        |
|-------|--|--------------------|
| 1     | All purposes (e.g. Instance electricity is detected the part, phosphorescence pharmaceutical etc.) | Banned immediately |

## Halogenated diphenyl dethanes (Ugilec141 · Ugilec121 · DBBT)

| Level | Targets  | Banned time        |
|-------|--|--------------------|
| 1     | - All purposes (e.g. ones for capacitors, lubricants, insulating oils, transformers containing oil). | Banned immediately |

## Substances: Perfluorooctane sulfonates (PFOS) and Perfluorooctane sulfonyl fluoride (POSF) and Perfluorooctyl acid (PFOA)

| Level | Targets  | Banned time        |
|-------|--|--------------------|
| 1     | All purposes (e.g. semiconductor materials, textiles, leathers). | Banned immediately |

## Substances: Specific phthalates (DEHP, DBP, BBP, DIBP, DINP, DIDP, DNOP)

| Level                                     | Targets   | Banned time        |
|---|---|--------------------|
| 1   | - All uses (e.g Plastic)  | Banned immediately |
| 3   | DINP, DIDP and DNOP using in all purposes excluding Wire (cables) and Connectors. |                    |
| The allowed concentration is 1000PPM MAX. |   |                    |

**Table List of specific phthalates (phthalic esters)**

| Abbreviation | CAS NO.  | Specific phthalates        |
|--------------|----------|----------------------------|
| DEHP         | 117-81-7 | Di (2-ethylhexyl)phthalate |



## Hazardous Substances Classification, Application and Banned Time

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|      |                          |  |
|------|--------------------------|--|
| DBP  | 84-74-2                  | Di-n-butyl phthalate                     |
| BBP  | 85-68-7                  | Butyl benzyl phthalate                   |
| DIBP | 16 84-69-5               | Di-iso-butyl Phthalate                   |
| DINP | 28553-12-0<br>68515-48-0 | Diisononyl phthalate (technical mixture) |
| DIDP | 26761-40-0<br>68515-49-1 | Diisononyl phthalate (technical mixture) |
| DNOP | 117-84-0                 | Di-n-octyl phthalate                     |
| DNHP | 84-75-3                  | Di-n-hexyl phthalate                     |
| DPP  | 84-62-8                  | Diphenyl phthalate                       |
| DMP  | 131-11-3                 | Dimethyl Phthalate                       |
| DEP  | 84-66-2                  | Diethyl Phthalate                        |
| DPRP | 131-16-8                 | Di-n-propyl Phthalate                    |
| DNPP | 131-18-0                 | Di-n-pentyl Phthalate                    |
| DCHP | 84-61-7                  | Dicyclohexyl Phthalate                   |
| DNP  | 84-76-4                  | Di-n-nonyl phthalate                     |
| DIBP | 84-69-5                  | Di-iso-butyl Phthalate                   |
| DIHP | 68515-50-4               | Di-iso-hexyl phthalate                   |
| DIOP | 27554-26-3               | Di-iso-octyl Phthalate                   |
| ---- | -----                    | Other Phthalates                         |

### PAHs

| Level | Targets  | Banned time        |
|-------|--|--------------------|
| 1     | Rubber or plastic components that come into direct as well as prolonged or short-term repetitive contact with the human skin or the oral cavity, under normal or reasonably foreseeable conditions of use. | Banned immediately |

Allowable concentration for Polycyclic Aromatic Hydrocarbons :

| Parameter            | Category 1 | Category 2 | Category 3 |
|----------------------|------------|------------|------------|
| Benzo (a) pyrene     | <0.2 mg/kg | <0.2 mg/kg | <0.5 mg/kg |
| Benzo[e]pyrene       | <0.2 mg/kg | <0.2 mg/kg | <0.5 mg/kg |
| Benzo[a]anthracene   | <0.2 mg/kg | <0.2 mg/kg | <0.5 mg/kg |
| Benzo[b]fluoranthene | <0.2 mg/kg | <0.2 mg/kg | <0.5 mg/kg |
| Benzo[j]fluoranthene | <0.2 mg/kg | <0.2 mg/kg | <0.5 mg/kg |
| Benzo[k]fluoranthene | <0.2 mg/kg | <0.2 mg/kg | <0.5 mg/kg |
| Chrysene             | <0.2 mg/kg | <0.2 mg/kg | <0.5 mg/kg |



## Hazardous Substances Classification, Application and Banned Time

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|                         |               |             |                |
|-------------------------|---------------|-------------|----------------|
| Dibenzo[a,h]anthracene  | < 0.2 mg/kg   | < 0.2 mg/kg | < 0.5 mg/kg    |
| Benzo[g,h,i]perylene    | < 0.2 mg/kg   | < 0.2 mg/kg | < 0.5 mg/kg    |
| Indeno[1,2,3-c,d]pyrene | < 0.2 mg/kg   | < 0.2 mg/kg | < 0.5 mg/kg    |
| Acenaphthylene          | Sum < 1 mg/kg | < 5 mg/kg   | Sum < 20 mg/kg |
| Acenaphthene            |               |             |                |
| Fluorene                |               |             |                |
| Phenanthrene            |               |             |                |
| Pyrene                  |               |             |                |
| Anthracene              |               |             |                |
| Fluoranthene            |               |             |                |
| Naphthalen              | < 1mg/kg      | < 2mg/kg    | < 10mg/kg      |
| Sum of 18 PAHs          | < 1mg/kg      | < 5mg/kg    | < 20mg/kg      |

Table 18 common PAHs :

| Abbreviation | PAHs                   | CAS No.  |
|--------------|------------------------|----------|
| Nap          | Naphthalene            | 91-20-3  |
| AcPY         | Acenaphthylene         | 208-96-8 |
| AcP          | Acenaphthene           | 83-32-9  |
| Flu          | Fluorene               | 86-73-7  |
| PA           | Phenanthrene           | 85-01-8  |
| Ant          | Anthracene             | 120-12-7 |
| FL           | Fluoranthene           | 206-44-0 |
| Pyr          | Pyrene                 | 129-00-0 |
| BaA          | Benzo[a]anthracene     | 56-55-3  |
| CHR          | Chrysene               | 218-01-9 |
| BbF          | Benzo[b]fluoranthene   | 205-99-2 |
| BkF          | Benzo[k]fluoranthene   | 207-08-9 |
| BaP          | Benzo[a]pyrene         | 50-32-8  |
| DBA          | Dibenz[a,h]anthracene  | 53-70-3  |
| IND          | Indeno[1,2,3-cd]pyrene | 193-39-5 |
| BghiP        | Benzo[g,h,i]perylene   | 191-24-2 |



## Hazardous Substances Classification, Application and Banned Time

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|      |                      |          |
|------|----------------------|----------|
| BjFA | Benzo[j]fluoranthene | 205-82-3 |
| BeP  | Benzo[e]pyrene       | 192-97-2 |

Fragrance substance (Musk xylene and Musk ketone)

| Level                               | Targets                       | Banned time        |
|-------------------------------------|-------------------------------|--------------------|
| 1                                   | -All purposes (e.g. essence). | Banned immediately |
| -Allowed concentration:500 ppm MAX. |                               |                    |

Pentachlorophenol(PCP)

| Level | Targets  | Banned time        |
|-------|--|--------------------|
| 1     | -All purposes (e.g. preservative and pesticide). | Banned immediately |

Pentachlorothiophenol (PCTP)

| Level | Targets                       | Banned time        |
|-------|-------------------------------|--------------------|
| 1     | -All purposes (e.g. rubber ). | Banned immediately |

Phenol, Isopropylated phosphate (3:1) (PIP 3:1)

| Level | Targets       | Banned time        |
|-------|---------------|--------------------|
| 1     | -All purposes | Banned immediately |

Arsenic (As) and Arsenic compounds

| Level                               | Targets               | Banned time        |
|-------------------------------------|-----------------------|--------------------|
| 1                                   | - All purposes        | Banned immediately |
| 3                                   | - semiconductor & PCB |                    |
| -Allowed concentration:1000ppm MAX. |                       |                    |

Antimony(Sb) and its compounds



## Hazardous Substances Classification, Application and Banned Time

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| Level                               | Targets   | Banned time        |
|-------------------------------------|---|--------------------|
| 1                                   | -HF material<br>-Mechanical plastic parts above 25 grams.<br>-Mechanical plastic part: plastic parts that do not internally carry an electrical signal such as housings, brackets, bezels   | Banned immediately |
| 3                                   | All purposes except those classified as Level 1, such as<br>a. Solder and solder pastes used in pin attach and flip chip integrated circuits.<br>b. Varistors used for surge suppression/over-voltage protection in power supplies.<br>c. Halogen plastic (< 25g) and halogen cable. fan(cooler,blower), thermal module and adaptor, etc. |                    |
| -Allowed concentration:1000ppm MAX. |   |                    |

### Substances:Beryllium oxide

| Level | Targets    | Banned time        |
|-------|------------|--------------------|
| 1     | - All uses | Banned immediately |

### Substances:Dimethylfumarate (DMF)

| Level | Targets                           | Banned time        |
|-------|-----------------------------------|--------------------|
| 1     | - All purposes (e.g. antiseptic). | Banned immediately |

### Substances: Red Phosphorus · Yellow Phosphorus

| Level | Targets   | Banned time        |
|-------|-----------|--------------------|
| 1     | -All uses | Banned immediately |

### Substances: Organophosphorus Compounds

| Level                               | Targets   | Banned time        |
|-------------------------------------|---|--------------------|
| 1                                   | - Tris(1-chloro-2-propyl)phosphate (TCPP) and Tris(2-chloroethyl) phosphate, TCEP) and (Tris (1,3-Dichloro-2-propyl)phosphate; TDCPP) using in retardants | Banned immediately |
| 3                                   | Except Organophosphorus compounds listed in level 1, organophosphorus retardants used in products   |                    |
| -Allowed concentration:1000ppm MAX. |   |                    |



# Hazardous Substances Classification, Application and Banned Time

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Substances: 2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)

| Level | Targets   | Banned time        |
|-------|-----------|--------------------|
| 1     | -All uses | Banned immediately |

Substances: Phenol,2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-dimethylethyl)

| Level | Targets  | Implementation Date |
|-------|--|---------------------|
| 1     | All purposes (e.g. binder,paint, ink and plastic material) | Banned immediately  |

Substances: Nonylphenol / ethoxylates(NP / NPEs) and related substances

| Level | Targets      | Implementation Date |
|-------|--------------|---------------------|
| 1     | All purposes | Banned immediately  |

Substances: Alkyphenols

| Level | Targets      | Implementation Date |
|-------|--------------|---------------------|
| 1     | All purposes | Banned immediately  |

Substances: 4,4'-Diaminodiphenylmethane

| Level | Targets  | Implementation Date |
|-------|--|---------------------|
| 1     | Hardener used as an epoxy resins and adhesives | Banned immediately  |

Less than 1000 ppm.

Substances:Fluorinated Greenhouse Gases

| Level | Targets  | Implementation Date |
|-------|--|---------------------|
| 1     | All purposes including in manufacturing process of any parts , components materials or poroducts. Fluorinated greenhouse gases listed in Table 5.2g and Table 5.2h, including Perfluorocarbons (PFCs), hydroflubrocarbons (HFCs), sulphur hexafluoride (SF6) | Banned immediately  |

List of the Perfluorocarbons(PFCs)

| CAS No.  | Perfluorocarbons(PFCs)                  |
|----------|---|
| 75-73-0  | Carbon tetrafluoride (Perfluoromethane) |
| 76-16-4  | Perfluoroethane (Hexafluoroethane)      |
| 76-19-7  | Perfluoropropane (Octafluoropubtane)    |
| 355-25-9 | Perfluorobutane (Decafluorobutane)      |



## Hazardous Substances Classification, Application and Banned Time

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|             |   |
|-------------|---|
| 678-26-2    | Perfluoropentane (Dodecafluoropentane)      |
| 355-42-0    | Perfluorohexane (Tetradecafluorohexane)     |
| 115-25-3    | Perfluorocyclobutane                        |
| 75-46-7     | Trifluoromethane(HFC-23)                    |
| 75-10-5     | Difluoromethane(HFC-32)                     |
| 593-53-3    | Methyl fluoride(HFC-41)                     |
| 138495-42-8 | 2H,3H-Decafluoropentane (HFC-43-10mee)      |
| 354-33-6    | Pentafluoroethane (HFC-125)                 |
| 359-35-3    | 1,1,2,2-Tetrafluoroethane (HFC-134)         |
| 811-97-2    | 1,1,1,2-Tetrafluoroethane (HFC-134a)        |
| 75-37-6     | 1,1-Difluoroethane (HFC-152a)               |
| 430-66-0    | 1,1,2-Trichloroethane (HFC-143)             |
| 420-46-2    | 1,1,1-Trichloroethane (HFC-143a)            |
| 431-89-0    | 2H-Heptafluoropropane (HFC-227ea)           |
| 677-56-5    | 1,1,1,2,2,3-Hexafluoro-propane (HFC-236cb)  |
| 431-63-0    | 1,1,1,2,3,3,-Hhexafluoropropane (HFC-236ea) |
| 690-39-1    | 1,1,1,3,3,3-Hexafluoropropane(HFC-236fa)    |
| 679-86-7    | 1,1,2,2,3-Pentafluoropropane(HFC-245ca)     |
| 460-73-1    | 1,1,1,3,3-Pentafluoropropane (HFC-245fa)    |
| 406-58-6    | 1,1,1,3,3-Pentafluorobutane (HFC-365mfa)    |

Substances: 2,4,6-Tri-tert-butylphenol

| Level | Targets          | Implementation Date |
|-------|------------------|---------------------|
| 1     | Lubricating oils | Banned immediately  |

Substances: Tri-(2,3-dibromo-propyl phosphate)



## Hazardous Substances Classification, Application and Banned Time

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| Level                                  | Targets      | Implementation Date |
|--|--------------|---------------------|
| 1                                      | All purposes | Banned immediately  |
| Allowable concentration: Not Detected. |              |                     |

Substances: Tris-(1-aziridiny) phosphin oxide

| Level                                  | Targets      | Implementation Date |
|--|--------------|---------------------|
| 1                                      | All purposes | Banned immediately  |
| Allowable concentration: Not Detected. |              |                     |

Substances: **Benzene**

| Level                                | Targets  | Banned time        |
|--------------------------------------|--|--------------------|
| 1                                    | - All purposes including in manufacturing process of any parts, components, materials or products (ex. Cleaning agents, degreaser and demolder solutions.) | Banned immediately |
| 3                                    | - Solvents in paints, coatings, inks, adhesives, primers   |                    |
| - Allowed concentration: 100ppm MAX. |  |                    |

Substances: n-Hexane

| Level | Targets | Implementation Date |
|-------|---------|---------------------|
|-------|---------|---------------------|





## Hazardous Substances Classification, Application and Banned Time

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|   |  |                    |
|---|--|--------------------|
| 1 | - All purposes including in manufacturing process of any parts, components, materials or products (ex. Cleaning agents, degreasers, demolder solutions.) | Banned immediately |
|---|--|--------------------|

Substances: Benzenamine, N- phenyl- , reaction products with styrene and 2,4,4-trimethylpentene(BNST)

| Level | Targets   | Implementation Date |
|-------|---|---------------------|
| 1     | All purposes (ex. additive in lubricants, rubber tires) | Banned immediately  |

Substances: Hexachlorobutadiene( HCBBD) , Hexachlorobenzene (HCB)

| Level | Targets      | Implementation Date |
|-------|--------------|---------------------|
| 1     | All purposes | Banned immediately  |

Substances: Toluene

| Level | Targets  | Banned time        |
|-------|--|--------------------|
| 1     | - All purposes including in manufacturing process of any parts, components, materials or products (ex. Cleaning agents, degreasers, demolder solutions.) | Banned immediately |
| 3     | - Solvents in paints, coatings, inks, adhesives, primers   |                    |

-Allowed concentration:100ppm MAX.

Substances: N-methylpyrrolidone (NMP)

| Level | Targets   | Banned time        |
|-------|---|--------------------|
| 1     | All purposes including in manufacturing process of any parts, components, materials or products (ex. Cleaning agents, degreasers, demolder solutions) | Banned immediately |



# Hazardous Substances Classification, Application and Banned Time

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-Allowed concentration:100ppm MAX.

Substances:Beryllium oxide

| Level | Targets     | Banned time        |
|-------|-------------|--------------------|
| 1     | - All uses. | Banned immediately |

Substances:Diarsenic trioxide, Diarsenic pentaoxide

| Level | Targets   | Banned time        |
|-------|---|--------------------|
| 1     | - Antifoam agents or fining agents for LCDpanels (including cover glasses touchscreens, and backlights) | Banned immediately |
| 3.    | - All uses other than above   |                    |

Substances:Perchlorates

| Level | Targets    | Banned time |
|-------|------------|-------------|
| 3     | - All uses |             |

-Allowed concentration:0.006 ppm MAX.

Substances: n-Propyl Bromide (nPB)

| Level | Targets  | Banned time        |
|-------|--|--------------------|
| 1     | - All purposes   | Banned immediately |
| 3     | - Cleaning solvent and used as an intermediate in the synthesis ofquaternary ammonium compounds.<br>Also used as a solvent in adhesive sprays. |                    |

-Allowed concentration:100ppm MAX.

Substances: Long-chain perfluoroalkyl carboxylate (LCPFACs) and perfluoroalkyl sulfonate chemicals(PFAS)

| Level | Targets    | Banned time        |
|-------|------------|--------------------|
| 1     | - All uses | Banned immediately |

Substances: PFCAs C9-C21-related substances

| Level | Targets    | Banned time        |
|-------|------------|--------------------|
| 1     | - All uses | Banned immediately |



# Hazardous Substances Classification, Application and Banned Time

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Substances: Specific phthalates (MOAH and MOSH)

| Level                                     | Targets   | Banned time        |
|---|---|--------------------|
| 1   | - Printing ink used in packaging  | Banned immediately |
| 2   | DINP, DIDP and DNOP using in all purposes excluding Wire (cables) and Connectors. | 2024/7/1           |
| The allowed concentration is 1000PPM MAX. |   |                    |

Substances: 2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)

| Level | Targets    | Banned time        |
|-------|------------|--------------------|
| 1     | - All uses | Banned immediately |

Substances: Additional rules for packaging materials

| Level | Targets   | Banned time        |
|-------|---|--------------------|
| 1     | The articles used for cartons to package products, cartons for returnable boxes, and packaging for part transportation. (e.g. handles, reels, sticks, magazines, bags, staples, sheets, wraps, paints, inks, tapes, labels, cushions, wooden frames, corrugated cardboard, vinyl ties, cushioning materials, and foil or trays)<br><br>Less than 100 ppm is determined as an allowable total-concentration of four heavy metals (Cd,Pb,Cr+6,Hg). Less than 5 ppm is determined as an allowable cadmium concentration in a plastic (including rubber) part, paints and inks. (Typical plastic parts: handles, cushions, wraps, reels, tapes, sticks, magazines, polyvinyl bags, and foil or trays) | Banned immediately |

Description :

DEHP、DBP、BBP、DIBP End users of packaging plastic parts and products will be prohibited from use.  
 PFAS -Allowed concentration: Not Detected.  
 Phthalates Sum -Allowed total-concentration: 100 ppm MAX.  
 Cd,Pb,Cr+6,Hg -Allowed total-concentration: 100 ppm MAX.

Illustrative examples of PACKAGING materials

Note: The following lists provide some examples of the products, which we categorize as “packaging” as well as “not packaging,” to serve as a reference. They are not intended to include all products in both categories.

| ITEM | NAME   | DESCRIPTION  |
|------|--------|--|
| 1.   | Carton | Including master carton and sub-master carton made from any materials. |



## Hazardous Substances Classification, Application and Banned Time

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|     |                                      |  |
|-----|--------------------------------------|--|
| 2.  | Cushion                              |  |
| 3.  | Protection bag ,<br>protection sheet | Such as made from foamed plastic or nonwoven fabric.   |
| 4.  | Plastic bag                          |  |
| 5.  | Envelope                             | Such as used for warranty card.  |
| 6.  | Blister pack                         |  |
| 7.  | Film                                 | Including protection films such as used for the LCD displays.                                  |
| 8.  | Clamshell                            |  |
| 9.  | Separator ,spacer,<br>partition      |  |
| 10. | Printing ink                         | Used for packaging   |
| 11. | Adhesive tape                        | Such as used for closing carton or poly bag, or, fixing or protection for removable component. |
| 12. | Staple                               |  |
| 13. | Label                                | Sticked on the packaging component under control of Sony, such as bar-code label.              |
| 14. | Joint                                | Carton joint   |
| 15. | Band                                 | Such as PP band  |
| 16. | Hanging tab                          |  |
| 17. | Carrying handle                      | Including its related components   |
| 18. | Crate                                | Such as wooden frame   |
| 19. | Shrink film                          |  |
| 20. | Bottle                               |  |
| 21. | Sleeve                               |  |
| 22. | Jewel box                            | Such as packaging for fountain pen   |
| 23. | skid                                 |  |

Applicable to all batteries in commercial distribution

All metals, alloys, inorganic compounds, metal-organic compounds, inorganic salts, organic salts, and Cadmium-, lead-, and mercury-compounds

| Level | Targets  | Banned time        |
|-------|--|--------------------|
| 1     | Cadmium content in proportion to the total weight of batteries and battery pack does not exceed 0.0005 % | Banned immediately |



## Hazardous Substances Classification, Application and Banned Time

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|   |    |  |  |
|---|----|--|--|
|   | Cd |  |  |
|   | Pb | Lead content in proportion to the total weight of batteries and battery pack does not exceed 0.004%. (including seal lead-acid batteries) (solder used in battery packs: 800 ppm). |  |
|   | Hg | - Hg Mercury content in proportion to the total weight of batteries and battery pack does not exceed 0.0001%.  |  |
| 3   | Pb | Dry cell battery (ex. Zinc Carbon Batteries) lead content in proportion to the total weight of batteries and battery pack does not exceed 0.004%                                   |  |
| If dry cell battery (ex. Zinc Carbon Batteries) lead content in batteries and battery pack does exceed 0.004%, it must follow 2006/66/EC label requirement. |    |  |  |

### EU REACH requirements

| Level  | Targets   | Banned time        |
|--|---|--------------------|
| 1  | -In Annex 17 of REACH, dangerous substances are listed in total to explain the restrictions on purpose of potential use and the conditions of producing, using, and consuming when placing in the EU market. The list will be updated all the time and updated by ECHA and can be referred to ECHA website :<br><a href="http://www.echa.eu">http://www.echa.eu</a> and <a href="https://echa.europa.eu/regulations/reach/restriction">https://echa.europa.eu/regulations/reach/restriction</a> | Banned immediately |
| -The list of SVHC will be continuously updated by ECHA and can be referred to ECHA website :<br><a href="http://echa.europa.eu/web/guest/candidate-list-table">http://echa.europa.eu/web/guest/candidate-list-table</a><br>-To comply with REACH regulation, suppliers shall submit the related SCIP information to UMEC upon request within the regulated period of time. |   |                    |

### Substances: restrictions for halogen-free products and components

| Level | Targets   | Banned time        |
|-------|---|--------------------|
| 1     | Bromine (Br)                                    | $\leq 900$ ppm     |
|       | Chlorine (Cl)                                   | $\leq 900$ ppm     |
|       | Total concentration of bromine(Br)+chlorine(Cl) | $\leq 1500$ ppm    |
|       |   | Banned immediately |



# Hazardous Substances Classification, Application and Banned Time

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|   |  |           |  |
|---|--|-----------|--|
|   | Antimony Trioxide Sb <sub>2</sub> O <sub>3</sub>   | ≤ 1000ppm |  |
|   | Triphenyl Phosphate (TPP) → Banned                 |           |  |
|   | PART NO. Status “HF” shall meet this requirements. |           |  |
| 3 | No halogen-free requirements.                      |           |  |

## Conflict Minerals management requirements

| Level | Targets  | Banned time        |
|-------|--|--------------------|
| 1     | - UMEC requires the products, components and materials etc. delivered by its suppliers does not contain Tin 、Tantalum 、gold 、 Tungsten 、Cobalt 、Mica or their derivatives, or any other minerals or their derivatives determined by the Secretary of State to be financing conflict in the Democratic Republic of the Congo or an adjoining country.<br><a href="https://www.responsiblemineralsinitiative.org/reporting-templates/cmrt/">https://www.responsiblemineralsinitiative.org/reporting-templates/cmrt/</a><br><a href="https://www.responsiblemineralsinitiative.org/reporting-templates/emrt/">https://www.responsiblemineralsinitiative.org/reporting-templates/emrt/</a> | Banned immediately |

## China VOC Standard

| Level  | Targets   | Banned time        |
|--|---|--------------------|
| 1  | - protective coatings 、 inadhesive 、 Ink 、 cleaning agents. | Banned immediately |
| Allowed concentration: :<br>GB 30981-2020 Limits of harmful substances in industrial protective coatings ;<br><a href="http://openstd.samr.gov.cn/bzgk/gb/newGbInfo?hcno=24B8F23569AAABB041D0F93A39F6519D">http://openstd.samr.gov.cn/bzgk/gb/newGbInfo?hcno=24B8F23569AAABB041D0F93A39F6519D</a><br>GB 33372-2020 Limits of volatile organic compound inadhesive ;<br><a href="http://openstd.samr.gov.cn/bzgk/gb/newGbInfo?hcno=34A7173C8B6D2757DAEB6C4BEE8B9175">http://openstd.samr.gov.cn/bzgk/gb/newGbInfo?hcno=34A7173C8B6D2757DAEB6C4BEE8B9175</a><br>GB 38507-2020 Limit of volatile organic compound content in ink ;<br><a href="http://openstd.samr.gov.cn/bzgk/gb/newGbInfo?hcno=BEC525CEF58A6B3D25D125E166BDD515">http://openstd.samr.gov.cn/bzgk/gb/newGbInfo?hcno=BEC525CEF58A6B3D25D125E166BDD515</a><br>GB 38508-2020 Limits of volatile organic compounds in cleaning agents 。<br><a href="http://openstd.samr.gov.cn/bzgk/gb/newGbInfo?hcno=FE1FC015A8AC8E87F74085C3ADE06C3E">http://openstd.samr.gov.cn/bzgk/gb/newGbInfo?hcno=FE1FC015A8AC8E87F74085C3ADE06C3E</a> |   |                    |



# 有害物質之相關化合物資訊

## Details of Substances

1 OF 12

### · 鎘以及鎘化合物 (Cadmium and it's compounds)

#### 1. 所屬物質的例子

所屬物質是指包含鎘元素的全部物質。

| 中文名稱<br>(通稱,簡稱,化學<br>名稱等) | Substances                   | CAS 號碼     | 化學分子式  | 主要用途                 |
|---------------------------|------------------------------|------------|--|----------------------|
| 鎘                         | Cadmium                      | 7440-43-9  | Cd   | 連接材料,表面處理            |
| 鎘合金                       | Cadmium alloys               |            |  | 低熔點焊接,保險絲等           |
| 氧化鎘                       | Cadmium oxide                | 1306-19-0  | CdO  | 顏料,鹼性電池<br>化學合成材料    |
| 氯化鎘                       | Cadmium chloride             | 10108-64-2 | CdCl <sub>2</sub>  | 用於電鍍浴(液),氯<br>乙烯的穩定劑 |
| 硫化鎘                       | Cadmium sulfide              | 1306-23-6  | CdS  | 顏料,半導體受光<br>元件,油漆,墨水 |
| 硝酸鎘                       | Cadmium nitrate              | 10325-94-7 | Cd(NO <sub>3</sub> ) <sub>2</sub>                                | 著色劑,電池,相片            |
| 四水硝酸鎘                     | Cadmium nitrate tetrahydrate | 10022-68-1 | Cd(NO <sub>3</sub> ) <sub>2</sub> ·4H <sub>2</sub> O             |                      |
| 硫酸鎘                       | Cadmium sulfate              | 10124-36-4 | CdSO <sub>4</sub>  | 鎘,鎘電池                |
| 硬脂酸鎘                      | Cadmium stearate             | 2223-93-0  | Cd(C <sub>18</sub> H <sub>35</sub> O <sub>2</sub> ) <sub>2</sub> | 用於氯乙烯的穩定<br>劑        |
| 其他鎘化合物                    | Other cadmium compounds      |            |  |                      |



# 有害物質之相關化合物資訊

## Details of Substances

2 OF 12

### 鉛以及鉛化合物 (Lead and it's compounds)

#### 1. 所屬物質的例子

所屬物質是指包含鉛元素的全部物質。

| 中文名稱<br>(通稱,簡稱,化學<br>名稱等)     | Substances                  | CAS 號碼                  | 化學分子式   | 主要用途                |
|-------------------------------|-----------------------------|-------------------------|---|---------------------|
| 鉛,金屬鉛                         | Lead metal                  | 7349-92-1               | Pb  |                     |
| 鉛/錫合金                         | Lead/tin alloy              | 39412-44-7              | Pb-Sn   | 焊接,塗蠟材料,電氣連接        |
| 氧化鉛(二價)                       | Lead (II) oxide             | 1317-36-8               | PbO   | 顏料,橡膠硫化促進劑,固體潤滑劑    |
| 二氧化鉛,氧化鉛,<br>氧化鉛(IV),<br>過氧化鉛 | Lead (IV) oxide             | 1309-60-0               | PbO <sub>2</sub>  | 鉛酸電池,橡膠固化劑,顏料的原料    |
| 三氧化二鉛                         | Dilead trioxide             | -                       | Pb <sub>2</sub> O <sub>3</sub>                          |                     |
| 四氧化三鉛, 四氧化三鉛(二價,四價)           | Lead (II,IV) oxide          | 1314-41-6               | Pb <sub>3</sub> O <sub>4</sub>                          | 顏料,鉛酸電池,玻璃,塗料       |
| 疊氮化鉛,鉛疊氮化物                    | Lead azide                  | 13424-46-9              | PbN <sub>6</sub>  |                     |
| 氟化鉛(二價)                       | Lead (II) fluoride          | 7783-46-2               | PbF <sub>2</sub>  | 特殊光學玻璃,顏料           |
| 氯化鉛(二價)                       | Lead (II) chloride          | 7758-95-4               | PbCl <sub>2</sub>                                       |                     |
| 四氯化鉛,氯化鉛(四價)                  | Lead (IV) chloride          | 13463-30-4              | PbCl <sub>4</sub>                                       |                     |
| 碘化鉛(二價)                       | Lead (II) iodide            | 10101-63-0              | PbI <sub>2</sub>  | 青銅,印刷,相片            |
| 硫化鉛(二價)                       | Lead (II) sulfide           | 1314-87-0               | PbS   | 半導體紫外線檢測器           |
| 氰化鉛(二價)                       | Lead (II) cyanide           | 592-05-2                | Pb(CN) <sub>2</sub>                                     | 防銹顏料                |
| 氟化硼鉛                          | Lead fluoroborate           | 13814-96-5              | Pb(BF <sub>4</sub> ) <sub>2</sub>                       | 電鍍浴(液),耐蝕表面處理       |
| 氟化硅鉛                          | Lead fluosilicate           | 25808-74-6              | PbSiF <sub>6</sub>                                      | 電鍍浴(液),鉛精鍊          |
| 硝酸鉛                           | Lead nitrate                | 10099-74-8              | Pb(NO <sub>3</sub> ) <sub>2</sub>                       | 光學玻璃                |
| 碳酸鉛                           | Lead carbonate              | 598-63-0                | PbCO <sub>3</sub>                                       |                     |
| 氫氧碳化鉛                         | Lead hydroxycarbonate       | 1344-36-1               | (PbCO <sub>3</sub> ) <sub>2</sub> Pb(OH) <sub>2</sub>   | 顏料,聚氯乙烯穩定劑          |
| 高氯化鉛                          | Lead perchlorate            | 13637-76-8              | Pb(ClO <sub>4</sub> ) <sub>2</sub>                      |                     |
| 硫酸鉛(二價)                       | Lead (II) sulfate           | 7446-14-2<br>15739-80-7 | PbSO <sub>4</sub>                                       | 顏料,橡膠配合劑,聚氯乙烯穩定劑,電池 |
| 硫酸鉛                           | Lead oxide sulfate          | 12202-17-4              | Pb <sub>4</sub> SO <sub>7</sub>                         | 顏料                  |
| 磷酸鉛(二價)                       | Lead (II) phosphate         | 7446-27-2               | Pb <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub>         | 塑膠穩定劑               |
| 硫氰酸鉛                          | Lead thiocyanate            | 592-87-0                | Pb(SCN) <sub>2</sub>                                    | 染色、火柴               |
| 三水醋酸亞鉛(二價)                    | Lead(II)acetate, trihydrate | 6080-56-4               | Pb(CH <sub>3</sub> COO) <sub>2</sub> ·3H <sub>2</sub> O |                     |
| 醋酸鉛(二價)                       | Lead (II) acetate           | 301-04-2                | Pb(CH <sub>3</sub> COO) <sub>2</sub>                    |                     |
| 醋酸鉛(四價)                       | Lead (IV) acetate           | 546-67-8                | Pb(CH <sub>3</sub> COO) <sub>4</sub>                    |                     |





# 有害物質之相關化合物資訊

## Details of Substances

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續：鉛以及鉛化合物 (Continue)

| 中文名稱<br>(通稱,簡稱,化學名稱等) | Substances                      | CAS 號碼                    | 化學分子式                                | 主要用途        |
|-----------------------|---------------------------------|---------------------------|--------------------------------------|-------------|
| 油酸鹽鉛                  | Lead oleate                     | 1120-46-3                 | $Pb[CH_3(CH_2)_7CH=CH(CH_2)_7COO]_2$ | 潤滑劑,硬化劑等    |
| 硬脂酸鉛                  | Lead stearate                   | 7428-48-0                 | $Pb(C_{17}H_{35}COO)_2$              | 聚氯乙烯穩定劑,潤滑劑 |
| 偏硼酸鉛<br>(二價)          | Lead(II) metaborate             | 10214-39-8                | $Pb(BO_2)_2 \cdot H_2O$              | 油漆的乾燥劑      |
| 硅酸鉛                   | Lead metasilicate               | 11120-22-2<br>22569-74-0  | $PbSiO_3$                            | 陶瓷          |
| 亞錒酸鉛                  | Lead antimonate                 | 122666-38-5<br>13150-89-9 | $Pb_3(SbO_4)_2$                      | 顏料,玻璃著色     |
| 砷酸鉛                   | Lead arsenate (1:1)             | 7784-40-9                 | $PbHAsO_4$                           |             |
| 亞砷酸鉛<br>(二價)          | Lead(II) arsenate               | 10031-13-7                | $Pb(AsO_2)_2$                        | 殺蟲劑         |
| 鉻酸鉛,鉻黃                | Lead chromate,<br>chrome yellow | 1344-37-2                 | $PbCrO_4$                            | 顏料,塗料,墨水    |
| 鉬酸鉛                   | Lead molybdate                  | 10190-55-3                | $PbMoO_4$                            | 顏料          |
| 鉛酸鈣                   | Calcium plumbate                | 12013-69-3                | $Ca_2PbO_4$                          | 氧化劑         |
| 四甲基鉛                  | Tetramethyllead                 | 75-74-1                   | $Pb(CH_3)_4$                         |             |
| 四乙鉛                   | Tetraethyllead                  | 78-00-2                   | $Pb(C_2H_5)_4$                       |             |
| 其他鉛化合物以及合金            | Other lead compounds and alloys |                           |                                      |             |



# 有害物質之相關化合物資訊

## Details of Substances

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### · 汞以及汞化合物 (Mercury and it's compounds)

#### 1. 所屬物質的例子

所屬物質是指包含汞元素的全部物質。

| 中文名稱<br>(通稱,簡稱,化學<br>名稱等) | Substances                   | CAS 號碼          | 化學分子式   | 主要用途             |
|---------------------------|------------------------------|-----------------|---|------------------|
| 汞                         | Mercury                      | 7439-97-6       | Hg  | 電極,水銀燈           |
| 汞合金,汞齊                    | Mercury alloys,<br>amalgam   | 15829-53-5      |   |                  |
| 氧化二汞 (一價)                 | Mercury (I) oxide            | 15829-53-5      | Hg <sub>2</sub> O   |                  |
| 氧化汞,<br>氧化汞(二價)           | Mercury (II) oxide           | 21908-53-2      | HgO   | 汞電池,防腐劑          |
| 二氯化汞 (一價)                 | Mercury (I) chloride         | 10112-91-1      | Hg <sub>2</sub> Cl <sub>2</sub>   | 電極,顏料            |
| 氯化汞 (二價)                  | Mercury (II) chloride        | 7487-94-7       | HgCl <sub>2</sub>   | 金屬蝕刻,乾電池,<br>防腐劑 |
| 硝酸汞 (二價)                  | Mercury (II) nitrate         | 10045-94-0      | Hg(NO <sub>3</sub> ) <sub>2</sub>   | 油毛氈,催化劑          |
| 硫酸汞 (一價)                  | Mercury (I) sulfate          |                 | Hg <sub>2</sub> SO <sub>4</sub>   | 電池               |
| 雷汞 (二價)                   | Mercury (II) fulminate       | 628-86-4        | Hg(ONC) <sub>2</sub>  |                  |
| 醋酸汞 (二價)                  | Mercury (II) acetate         | 1600-27-7       | Hg(CH <sub>3</sub> COO) <sub>2</sub>                                      |                  |
| 甲基汞鹽                      | Methylmercury salts          | e.g. 22967-92-6 | CH <sub>3</sub> HgX;<br>X=Cl,Br,I,OH, etc.                                | 防腐劑              |
| 乙烷基汞鹽                     | Ethylmercury salts           |                 | C <sub>2</sub> H <sub>5</sub> HgX;<br>X=Cl,Br,I,OH, etc.                  | 防腐劑,殺菌劑          |
| 丙基汞鹽                      | Propylmercury salts          |                 | C <sub>3</sub> H <sub>7</sub> HgX;<br>X=Cl,Br,I,OH, etc.                  |                  |
| 苯基汞鹽                      | Phenylmercury salts          |                 | C <sub>6</sub> H <sub>5</sub> HgX;<br>X=Cl,Br,I,OH, etc.                  | 防腐劑,殺菌劑          |
| 甲基氧乙烷基汞鹽                  | Methoxyethylmercury<br>salts |                 | CH <sub>3</sub> OC <sub>2</sub> H <sub>4</sub> HgX;<br>X=Cl,Br,I,OH, etc. | 殺菌劑,防霉劑          |
| 二烷基組汞                     | Dialkylmercury               |                 | R <sub>2</sub> Hg; R=alkyl<br>group(C <sub>n</sub> H <sub>2n+1</sub> )    |                  |
| 二苯基汞                      | Diphenylmercury              | 587-85-9        | (C <sub>6</sub> H <sub>5</sub> ) <sub>2</sub> Hg                          |                  |
| 其他汞化合物                    | Other mercury<br>compounds   |                 |   |                  |



# 有害物質之相關化合物資訊

## Details of Substances

5 OF 12

### · 六價鉻化合物 (Chromium (Hexavalent) and it's compounds)

#### 1. 所屬物質的例子

所屬物質只有六價鉻。

因此,金屬鉻、鉻合金、鉻電鍍不屬於此類。

此外,三價鉻化合物也不屬於此類。

| 中文名稱<br>(通稱,簡稱,化學<br>名稱等) | Substances                                    | CAS 號碼                                   | 化學分子式  | 主要用途               |
|---------------------------|---|--|--|--------------------|
| 三氧化鉻,氧化鉻<br>(六價),酞化鉻      | Chromium(VI)oxide;<br>Chromium trioxide       | 1333-82-0                                | CrO <sub>3</sub>   | 顏料,催化劑,電鍍,鞣皮       |
| 鉻酸鋰                       | Lithium chromate                              | 14307-35-8                               | Li <sub>2</sub> CrO <sub>4</sub>                               | 防腐劑                |
| 鉻酸鈉                       | Sodium chromate                               | 7775-11-3                                | Na <sub>2</sub> CrO <sub>4</sub>                               | 防銹,鞣皮              |
| 鉻酸鉀                       | Potassium chromate                            | 7789-00-6                                | K <sub>2</sub> CrO <sub>4</sub>                                | 顏料,墨水,鞣皮           |
| 氯鉻酸鉀                      | Potassium<br>chlorochromate                   | 16037-50-6                               | K[CrO <sub>3</sub> Cl]   |                    |
| 鉻酸銨                       | Ammonium chromate                             | 7788-98-9                                | (NH <sub>4</sub> ) <sub>2</sub> CrO <sub>4</sub>               | 相片,催化劑             |
| 鉻酸銅                       | Copper chromate                               | 13548-42-0                               | CuCrO <sub>4</sub>   | 媒染劑                |
| 鉻酸鎂                       | Magnesium chromate                            | 13423-61-5                               | MgCrO <sub>4</sub>   | 防銹,表面處理            |
| 鉻酸鈣                       | Calcium chromate                              | 13765-19-0                               | CaCrO <sub>4</sub>   | 顏料,墨水,鞣皮           |
| 鉻酸銣                       | Strontium chromate                            | 7789-06-2                                | SrCrO <sub>4</sub>   | 顏料,防銹              |
| 鉻酸鋇                       | Barium chromate                               | 10294-40-3                               | BaCrO <sub>4</sub>   | 防腐,顏料,<br>陶瓷用著色劑   |
| 鉻酸鉛,鉻黃                    | Lead chromate;<br>Chrome yellow               | 1344-37-2                                | PbCrO <sub>4</sub>   | 顏料,塗料,墨水           |
| 鉻酸鋅                       | Zinc chromate                                 | 12018-19-8;<br>13530-65-9;<br>14018-95-2 | ZnCrO <sub>4</sub>   | 顏料,防腐劑             |
| 重鉻酸鈉                      | Sodium dichromate;<br>Sodium bichromate       | 10588-01-9                               | Na <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>                 | 顏料,防腐,相片,鞣皮        |
| 重鉻酸鉀                      | Potassium dichromate;<br>potassium bichromate | 7778-50-9                                | K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>                  | 顏料,相片,電鍍,<br>電池,鞣皮 |
| 重鉻酸銨                      | Ammonium dichromate;<br>Ammonium bichromate   | 7789-09-5                                | (NH <sub>4</sub> ) <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> | 顏料,相片,催化劑          |
| 重鉻酸鈣                      | Calcium dichromate;<br>Calcium bichromate     | 14307-33-6                               | CaCr <sub>2</sub> O <sub>7</sub>                               | 防腐,催化劑             |
| 重鉻酸鋅                      | Zinc dichromate;<br>Zinc bichromate           | 14018-95-2                               | ZnCr <sub>2</sub> O <sub>7</sub>                               | 顏料                 |
| 其他六價鉻化合物                  | Other hexavalent<br>Chromium compounds        |  |  |                    |



# 有害物質之相關化合物資訊

## Details of Substances

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### · 多氯聯苯 (PCB)

#### 1. 所屬物質

| 中文名稱<br>(通稱,簡稱,化學名稱等) | Substances                     | CAS 號碼    | 化學分子式                                | 主要用途         |
|-----------------------|--------------------------------|-----------|--------------------------------------|--------------|
| 多氯聯苯(PCB)、<br>聚氯聯苯    | PCB; polychlorinated biphenyls | 1336-36-3 | $C_{12}H_{10-x}Cl_x$<br>( $x=1-10$ ) | 熱溶劑,潤滑劑和電容器油 |

### · 多氯化萘 (PCN)

#### 1. 所屬物質的例子

| 中文名稱<br>(通稱,簡稱,化學名稱等) | Substances                  | CAS 號碼    | 化學分子式                              | 主要用途       |
|-----------------------|-----------------------------|-----------|------------------------------------|------------|
| 聚氯化萘                  | Polychlorinated naphthalene |           | $C_{10}H_{8-x}Cl_x$ ( $x \geq 3$ ) | 潤滑劑,防腐劑,塗料 |
| 三氯化萘                  | Trichloronaphthalene        | 1321-65-9 | $C_{10}H_5Cl_3$                    |            |
| 四氯化萘                  | Tetrachloronaphthalene      | 1335-88-2 | $C_{10}H_4Cl_4$                    |            |
| 五氯化萘                  | Pentachloronaphthalene      | 1321-64-8 | $C_{10}H_3Cl_5$                    |            |
| 八氯化萘                  | Octachloronaphthalene       | 2234-13-1 | $C_{10}Cl_8$                       |            |

### · 氯代烷烴 (CP)

#### 1. 所屬物質

| 中文名稱<br>(通稱,簡稱,化學名稱等)             | Substances  | CAS 號碼             | 化學分子式 | 主要用途    |
|-----------------------------------|---|--------------------|-------|---------|
| 氯代烷烴,<br>碳原子數 10-13,<br>氯 50wt%以上 | Short-chain Chlorinated paraffin<br>$C_{10-13}, Cl \geq 50$ wt% | e.g.<br>10871-26-2 | -     | 增塑劑,阻燃劑 |

### · 滅蟻靈 (Mirex)

#### 1. 所屬物質

| 中文名稱<br>(通稱,簡稱,化學名稱等)                             | Substances  | CAS 號碼    | 化學分子式           | 主要用途        |
|---|---|-----------|-----------------|-------------|
| 滅蟻靈,十二氯八氫<br>-1,3,4-美替諾-2H-<br>環丁二烯(c,d)併環<br>戊二烯 | Mirex(Perchlordecone)<br>;Dodecachlorooctahydro-<br>1,3,4-metheno-2H-<br>cycrobuta(cd)pentalen<br>e | 2385-85-5 | $C_{10}Cl_{12}$ | 阻燃劑,殺蟲劑,防霉劑 |



# 有害物質之相關化合物資訊

## Details of Substances

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### · 多溴聯苯 (PBB)

#### 1. 所屬物質

| 中文名稱<br>(通稱,簡稱,化學名稱等) | Substances                      | CAS 號碼          | 化學分子式                                | 主要用途 |
|-----------------------|---------------------------------|-----------------|--------------------------------------|------|
| 多溴化聯苯、<br>聚溴二聯苯、PBB   | Polybrominated<br>Biphenyls;PBB | e.g. 67774-32-7 | $C_{12}H_{10-x}Br_x$<br>( $x=1-10$ ) | 阻燃劑  |

### · 多溴二苯醚 (PBDE)

#### 1. 所屬物質的例子

| 中文名稱<br>(通稱,簡稱,化學名稱等)                   | Substances   | CAS 號碼     | 化學分子式                                 | 主要用途                     |
|---|--|------------|---------------------------------------|--------------------------|
| 聚溴二苯醚,聚溴二苯基氧化物,聚溴化二苯醚, PBDE, PBDO, PBBE | Polybromodiphenyl ether; polybromodiphenyloxiide; polybrominated biphenyl ethers; PBDE; PBDO; PBBE |            | $C_{12}H_{10-x}Br_xO$<br>( $x=1-10$ ) | 阻燃劑                      |
| 十溴二苯醚,十溴二苯基氧化物, DBDPE, DBDPO            | Decabromodiphenyl ether; decabromodiphenyloxiide; DBDPE; DBDPO                                     | 1163-19-5  | $C_{12}Br_{10}O$                      | 阻燃劑<br>(PE,ABS,聚酯用)      |
| 八溴二苯醚,八溴二苯基氧化物                          | Octabromodiphenyl ether; octabromodiphenyloxiide   | 32536-52-0 | $C_{12}H_2Br_8O$                      | 阻燃劑<br>(ABS,HIPS,LDPE 用) |
| 六溴二苯醚,六溴二苯基氧化物                          | Hexabromodiphenyl ether; Hexabromodiphenyl oxide   | 36483-60-0 | $C_{12}H_4Br_6O$                      | 阻燃劑                      |
| 五溴二苯醚,五溴二苯基氧化物                          | Pentabromodiphenyl ether; Pentabromodiphenyl oxide   | 32354-81-9 | $C_{12}H_5Br_5O$                      | 阻燃劑                      |

### · 四溴雙酚-A-雙-(2,3-二溴丙醚) (TBBP-A-bis)

#### 1. 所屬物質

| 中文名稱<br>(通稱,簡稱,化學名稱等)           | Substances   | CAS 號碼     | 化學分子式                 | 主要用途 |
|---------------------------------|--|------------|-----------------------|------|
| 四溴雙酚-A-雙-(2,3-二溴丙醚), TBBP-A-bis | Tetrabromobisphenol-A-bis-(2,3-dibromopropylether); TBBP-A-bis | 21850-44-2 | $C_{21}H_{10}Br_8O_2$ | 阻燃劑  |



# 有害物質之相關化合物資訊

## Details of Substances

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### · 有機錫化合物 (三丁基錫化合物、三苯基化合物) (Organic Tin compounds)

#### 1. 所屬物質的例子

僅三丁基、三苯基化合物符合、二丁基、二苯基等化合物不屬於此類。

因此,金屬錫、錫合金、電鍍錫、錫的無機化合物不屬於此類。

所屬物質的例子如下所示。

| 中文名稱<br>(通稱,簡稱,化學名稱等)                             | Substances  | CAS 號碼     | 化學分子式   | 主要用途 |
|---|---|------------|---|------|
| 溴化三丁基錫  | Tributyl tin bromide                                | 1461-23-0  | (C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnBr  | 殺菌劑  |
| 雙三丁基錫氧化物  | Tributyl tin oxide<br>bis(tributyl tin) oxide       | 56-35-9    | C <sub>24</sub> H <sub>54</sub> OSn <sub>2</sub>  | 殺菌劑  |
| 三苯基錫  | Triphenyl tin                                       | 668-34-8   | (C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> Sn  | 殺菌劑  |
| 溴化三苯基錫  | Triphenyl tin bromide                               |            | (C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> SnBr  | 殺菌劑  |
| 氯化三苯基錫  | Triphenyl tin chloride                              | 639-58-7   | (C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> SnCl  | 殺菌劑  |
| 羥基三苯基錫  | Triphenyl tin hydroxide                             | 76-87-9    | (C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> SnOH  | 殺菌劑  |
| 三苯基錫 N,N'-二<br>甲基二硫代氨基甲<br>酸鹽(二甲基二硫代<br>氨基甲酸三苯基錫) | Triphenyl tin N,N'-<br>Dimethyldithiocar-<br>Bamate | 1803-12-9  | (C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> Sn(CH <sub>3</sub> ) <sub>2</sub><br>NCS <sub>2</sub>                                   |      |
| 三苯基錫氟化物<br>(氟化三苯基錫)                               | Triphenyl tin fluoride<br>(fentin fluoride)         | 379-52-2   | (C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> SnF   |      |
| 三苯基錫乙酸鹽<br>(醋酸三苯基錫)                               | Triphenyl tin acetate<br>(fentin acetate)           | 900-95-8   | (C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> SnOCOCH <sub>3</sub>  |      |
| 三苯基錫脂肪酸鹽  | Triphenyl tin fatty<br>acid salts                   | 18380-71-7 | 不屬於此類   |      |
| 三苯基錫氯代乙酸<br>鹽                                     | Triphenyl tin<br>chloroacetate                      | 7094-94-2  | (C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> SnOCOC<br>H <sub>2</sub> Cl   |      |
| 三丁基錫甲基甲基<br>丙烯酸鹽                                  | Triphenyl tin<br>methacrylate                       | 2155-70-6  | (C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnC <sub>4</sub> H <sub>5</sub> O <sub>2</sub>  |      |
| 雙(三丁基錫) 富馬<br>酸鹽                                  | Bis(tributyl tin)<br>fumarate                       | 6454-35-9  | C <sub>2</sub> H <sub>2</sub> (COO) <sub>2</sub><br>([C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> Sn) <sub>2</sub>                   |      |
| 三丁基錫氟化物   | Triphenyl tin fluoride                              | 1983-10-4  | (C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnF   |      |
| 雙(三丁基錫) 2,3-<br>二溴丁二酸鹽                            | Bis(tributyl tin)2,3-<br>Dibromosuccinate           | 31732-71-5 | ([C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> Sn) <sub>2</sub> C <sub>2</sub> H <sub>2</sub><br>(BR) <sub>2</sub> (COO) <sub>2</sub> |      |
| 三丁基錫乙酸鹽<br>(醋酸三丁基錫)                               | Triphenyl tin acetate                               | 56-36-0    | (C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnOCOCH <sub>3</sub>  |      |
| 三丁基錫月桂酸鹽  | Triphenyl tin laurate                               | 3090-36-6  | (C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnC <sub>12</sub> H <sub>23</sub> O <sub>2</sub>  |      |



# 有害物質之相關化合物資訊

## Details of Substances

續：有機錫化合物 (三丁基錫化合物、三苯基化合物) (Continue)

| 中文名稱<br>(通稱,簡稱,化學名稱等)  | Substances   | CAS 號碼     | 化學分子式   | 主要用途 |
|--|--|------------|---|------|
| 雙(三丁基錫)苯二甲酸鹽   | Bis(tributyl tin) phthalate  | 4782-29-0  | (C <sub>6</sub> H <sub>4</sub> )(COO) <sub>2</sub><br>([C <sub>4</sub> H <sub>9</sub> ] <sub>3</sub> Sn) <sub>2</sub> |      |
| 三丁基錫磺酸鹽  | Tributyl tin sulfamate   | 6517-25-5  | (C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnSO <sub>3</sub> NH <sub>2</sub>                                       |      |
| 雙(三丁基錫)馬來酸鹽  | Bis(tributyl tin) maleate  | 14275-57-1 | C <sub>28</sub> H <sub>56</sub> O <sub>4</sub> Sn <sub>2</sub>  |      |
| 三丁基錫氯化物  | Tributyl tin chloride  | 1461-22-9  | (C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> SnCl  |      |
| 三丁基錫=環戊烷羧酸鹽和類似化合物的混合物(三丁基錫萘酸鹽)   | Mixture of tributyl tin cyclopentanecarboxylate and its analogs (tributyl tin naphthenate)   | 85409-17-2 |   |      |
| 三丁基錫=1,2,3,4,4a,4b,5,6,10,10a-十氫-7-異丙基-1,4a-二甲基-1-菲羧酸鹽和類似化合物的混合物(三丁基錫酪氨酸鹽) | Mixture of tributyl tin 1,2,3,4,4a,4b,5,6,10,10a-decahydro-7-isopropyl-1,4a-dimethyl-1-phenanthrenecarboxylate and its analogs (tributyl tin rosin salt) | 26239-64-5 | C <sub>32</sub> H <sub>56</sub> O <sub>2</sub> Sn   |      |
| 烷基丙烯酸鹽,甲基丙烯酸甲酯和甲基丙烯酸三丁基錫的共聚物(烷基丙烯酸鹽的碳原子數限定為 8 個)                           | Copolymer of alkyl acrylate,methyl Methacrylate and tributyl tin methacrylate (alkyl; C=8)   |            |   |      |



# 有害物質之相關化合物資訊

## Details of Substances

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### · 石棉 (Asbestos)

#### 1. 所屬物質

| 中文名稱<br>(通稱,簡稱,化學<br>名稱等) | Substances    | CAS 號碼                                  | 化學分子式  | 主要用途   |
|---------------------------|---------------|---|--|--------|
| 石棉 (總稱)                   | Asbestos      | 1332-21-4<br>132207-32-0<br>132207-33-1 |  | 絕緣體,填料 |
| 藍石棉                       | Crocidolite   | 12001-28-4                              | $\text{Na}_2\text{Fe}_5(\text{Si}_8\text{O}_{22})(\text{OH})_2$    | 絕緣體,填料 |
| 溫石棉                       | Chrysotile    | 12001-29-5                              | $\text{Mg}_3\text{Si}_2\text{O}_5(\text{OH})_4$                    | 絕緣體,填料 |
| 鐵石棉                       | Amosite       | 12172-73-5                              | $(\text{Mg,Fe})_7\text{Si}_8\text{O}_{22}(\text{OH})_2$            | 絕緣體,填料 |
| 直閃石                       | Anthophyllite | 17068-78-9                              | $(\text{Mg,Fe})_7\text{Si}_8\text{O}_{22}(\text{OH})_2$            | 絕緣體,填料 |
| 透閃石                       | Tremolite     | 14567-73-8                              | $\text{Ca}_2\text{Mg}_5\text{Si}_8\text{O}_{22}(\text{OH})_2$      | 絕緣體,填料 |
| 陽起石                       | Actinolite    | 13768-60-8                              | $\text{Ca}_2(\text{Mg,Fe})_5\text{Si}_8\text{O}_{22}(\text{OH})_2$ | 絕緣體,填料 |

### · 甲醛 (Formaldehyde)

#### 1. 所屬物質

| 中文名稱<br>(通稱,簡稱,化學<br>名稱等) | Substances   | CAS 號碼  | 化學分子式 | 主要用途                       |
|---------------------------|--|---------|-------|----------------------------|
| 甲醛(單基物),<br>福爾馬林          | Formaldehyde; formalin;<br>Formic aldehyde; formol | 50-00-0 | HCHO  | 防腐劑,單基物(如,酚醛<br>樹脂和三聚氰胺樹脂) |

### · 聚氯乙烯 (PVC) 以及 PVC 混合物

#### 1. 所屬物質的例子

| 中文名稱<br>(通稱,簡稱,化學<br>名稱等)          | Substances   | CAS 號碼         | 化學分子式 | 主要用途  |
|------------------------------------|--|----------------|-------|-------|
| PVC 和 PVC 混合<br>物,聚氯乙烯和聚<br>氯乙烯混合物 | PVC and PVC blends;<br>Polivynylchloride and<br>Polivynylchloride blends | e.g. 9002-86-2 |       | 氯乙烯樹脂 |





# 有害物質之相關化合物資訊

## Details of Substances

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### · 偶氮化合物 (Azo compounds)

按照德國日用品規則的試驗法,將偶氮化合物進行分解有可能產生的胺。

| 中文名稱<br>(通稱,簡稱,化學<br>名稱等) | Substances   | CAS 號碼   | 化學分子式 | 主要用途 | 備註 |
|---------------------------|--|----------|-------|------|----|
| 4-氨基苯基苯                   | 4-aminodiphenyl and its salts                      | 92-67-1  |       |      |    |
| 對二氨基聯苯                    | Benzidine and its salts                            | 92-87-5  |       |      |    |
| 四氯甲苯胺                     | 4-chloro-o-toluidine<br>(4-chloro-2-methylaniline) | 95-69-2  |       |      |    |
| 2-萘胺                      | 2-Naphthylamine                                    | 91-59-8  |       |      |    |
| 鄰氨基偶氮甲苯                   | o-Aminoazotoluene                                  | 97-56-3  |       |      |    |
| 二氨基四硝基甲苯                  | 2-Amino-4-Nitrotoluene                             | 99-55-8  |       |      |    |
| 氯苯胺                       | p-Chloroaniline                                    | 106-47-8 |       |      |    |
| 2,4-二氨基甲氧基<br>苯甲醚         | 2,4-Diaminoanisole                                 | 615-05-4 |       |      |    |
| 4,4'-二氨基苯化<br>甲烷          | 4,4'-Diaminodiphenylm-<br>ethane                   | 101-77-9 |       |      |    |
| 3,3'-二氯聯苯胺                | 3,3'-Dichlorobenzidine                             | 91-94-1  |       |      |    |
| 3,3'-二甲氧基聯<br>苯胺          | 3,3'-Dimethoxybenzidine                            | 119-90-4 |       |      |    |
| 3,3'-二甲基聯苯<br>胺           | 3,3'-Dimethylbenzidine                             | 119-93-7 |       |      |    |
| 3,3'-二甲基-4,4'-<br>二氨基二苯甲烷 | 3,3'-Dimethyl-4,4'-Diam-<br>inodiphenylmethane     | 838-88-0 |       |      |    |
| 氨基對甲苯甲醚                   | p-Cresidine<br>(5-Methyl-o-anisidine)              | 120-71-8 |       |      |    |
| 4,4'-亞甲基-雙<br>(二氯苯胺)      | 4,4'-Methylenebis<br>-(2-Chloroaniline)            | 101-14-4 |       |      |    |
| 4,4'-氧代苯胺                 | 4,4'-Oxydianiline                                  | 101-80-4 |       |      |    |
| 4,4'-硫雙苯胺                 | 4,4'-Thirdianilene<br>(4,4'-Thiobisbenzenamine)    | 139-65-1 |       |      |    |
| 鄰甲苯胺                      | o-Toluidine  | 95-53-4  |       |      |    |
| 2,4-甲代苯二胺                 | 2,4-Toluylenediamine<br>(toluene-2,4-diamine)      | 95-80-7  |       |      |    |
| 2,4,5-均三甲苯胺               | 2,4,5-Trimethylaniline                             | 137-17-7 |       |      |    |
| 鄰氨基苯甲醚                    | o-Anisidine  | 90-04-0  |       |      |    |
| 4-氨基偶氮苯                   | 4-Aminoazobenzene                                  | 60-09-3  |       |      |    |



# 有害物質之相關化合物資訊

## Details of Substances

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### · 全氟辛烷磺酸(及其鹽)(PFOS)

#### 1. 所屬物質

| 中文名稱<br>(通稱,簡稱,化學名稱等) | Substances                       | CAS 號碼            | 化學分子式  | 主要用途    |
|-----------------------|----------------------------------|-------------------|--|---------|
| PFOS: 全氟辛烷磺酸; 全氟辛基磺酸鉀 | PFOS: Perfluorooctane sulfonates | e.g.<br>2795-39-3 | C <sub>8</sub> F <sub>17</sub> SO <sub>2</sub> X | 拒水劑、拒油劑 |

### · 特定苯並三氮唑

#### 1. 所屬物質

| 中文名稱<br>(通稱,簡稱,化學名稱等)                                     | Substances  | CAS 號碼    | 化學分子式  | 主要用途          |
|---|---|-----------|--|---------------|
| 2-(3',5'-二叔丁基-2'-羥基苯基)苯並三唑;<br>2-(2'-羥基-3',5'-二叔丁基苯基)苯並三唑 | 2-(3',5'-Di-tert-butyl-2'-hydroxyphenyl)benzotriazole;<br>2-(2'-Hydroxy-3',5'-di-tert-butylphenyl)benzotriazole | 3846-71-7 | C <sub>20</sub> H <sub>25</sub> N <sub>3</sub> O | 紫外線防護劑、紫外線吸收劑 |

### 富馬酸二甲酯(DMF)

#### 1. 所屬物質

| 中文名稱<br>(通稱,簡稱,化學名稱等) | Substances        | CAS 號碼   | 化學分子式  | 主要用途    |
|-----------------------|-------------------|----------|--|---------|
| 富馬酸二甲酯                | Dimethyl fumarate | 624-49-7 | C <sub>6</sub> H <sub>8</sub> O <sub>4</sub> | 防菌劑、乾燥劑 |



# 環境有害物質之檢測方法

## Test Methods of Environmental Hazardous Substances

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| Test Item                                      | Equipment              | Method Used                    |
|--|------------------------|--------------------------------|
| Antimony (Sb) / Antimony Compounds (銻及化合物)     | ICP-AES                | US EPA 3050 B                  |
| Arsenic (As) / Arsenic Compounds (砷及化合物)       | ICP-AES                | US EPA 3052                    |
| Beryllium (Be) / Beryllium Compounds (鈹及化合物)   | ICP-AES                | US EPA 3050 B                  |
| Cadmium (Cd) / Cadmium Compounds (鎘及化合物)       | ICP-AES,<br>ICP-MS,AAS | IEC62321                       |
| Cobalt (Co) / Cobalt Compounds (鈷及化合物)         | ICP-AES                | US EPA 3050 B                  |
| Lead (Pb) / Lead Compounds (鉛及化合物)             | ICP-AES,<br>ICP-MS,AAS | IEC62321                       |
| Manganese (Mn) /Manganese Compounds (錳及化合物)    | ICP-AES                | US EPA 3050 B                  |
| Mercury (Hg) / Mercury Compounds (汞及化合物)       | ICP-AES,<br>ICP-MS,AAS | IEC62321                       |
| Nickel (Ni) / Nickel Compounds (鎳及化合物)         | ICP-MS                 | EN 1811, EPA3052,<br>EPA3050B, |
| Selenium (Se) / Selenium compounds (硒及化合物)     | ICP-AES                | US EPA 3052                    |
| Tellurium (Te) / Tellurium compounds (銻及化合物)   | ICP-AES                | —                              |
| Thallium (Tl) / Thallium compounds (銻及化合物)     | ICP-AES                | US EPA 3050B                   |
| Alumium (Al) / Alumium compounds (鋁及化合物)       | ICP-AES                | US EPA 3050B                   |
| Copper (Cu) / Copper compounds (銅及化合物)         | ICP-AES                | US EPA 3050B                   |
| Zinc (Zn) / Zinc compounds (鋅及化合物)             | ICP-AES                | US EPA 3050B                   |
| Barium (Ba) / Barium compounds (鋇及化合物)         | ICP-AES                | US EPA 3050B                   |
| Silicon (Si) / Silicon compounds (矽及化合物)       | ICP-AES                | —                              |
| Chromium (Cr) / Chromium compounds (鉻及化合物)     | ICP-AES                | US EPA 3050B                   |
| Hexavalent-Chromium(Cr6+)Compounds<br>(六價鉻化合物) | UV-VIS                 | IEC62321                       |
| Pb +Cd+Hg+Cr6+ (包裝材料)                          | ICP & UV               | 94/62/EEC, CONEG               |
| PBB (Polybrominated biphenyls) (多溴聯苯)          | GC/MS&LC/MS            | IEC62321                       |
| PBDE (Polybrominated diphenylethers) (多溴聯苯醚)   | GC/MS&LC/MS            | IEC62321                       |
| Polychlorinated Biphenyls (PCBs) (多氯聯苯)        | GC/MS/ECD              | US EPA 8082                    |
| Polychlorinated naphthalene (PCNs) (多氯萘)       | GC/MS/ECD              | US EPA 8082                    |
| Polychlorinated Terphenyls (PCTs) (多氯三聯苯)      | GC/MS/ECD              | US EPA 8082                    |
| Chlorinated paraffins (CP) (氯化石蠟) (C10~C13)    | GC/MS                  | EPA8082                        |
| Mirex (滅蟻靈) (CAS# 2385-85-5)                   | GC/MS                  | —                              |
| TBBP-A-bis (四溴雙酚-A-雙)-(2,3-二溴丙醚)               | LC/MS                  | —                              |
| TBBPA (四溴雙酚-A)(四溴丙二酚)                          | GC/MS                  | DIN 53313                      |
| PCP (五氯酚)                                      | GC/MS                  | USEPA8270D                     |



# 環境有害物質之檢測方法

## Test Methods of Environmental Hazardous Substances

| Test Item  | Equipment       | Method Used                |
|--|-----------------|----------------------------|
| TeCP (四氯酚)   | GC/MS           | USEPA8270D                 |
| Chlorobenzenes (氯苯)  | GC/MS           | USEPA8270D                 |
| Methyl chloride (氯甲烷)  | GC/MS/headspace | USEPA5021                  |
| Halogen Content Test ( <i>F, Cl, Br, I</i> )<br>(鹵素含量測試, 氟、氯、溴、碘)  | IC              | prEN 14582 Method B        |
| Polychlorinated Biphenyl ethers (PCDB) (多氯聯苯醚)   | GC/MS/ECD       | 89/677/EEC, US EPA 8082    |
| Dioxines (戴奧辛)   | GC/MS, HR       | US EPA 1613                |
| Benzene (苯)  | GC/MS/headspace | EPA 5021A-2003             |
| Toluene (甲苯)   |                 |                            |
| Xylenes (二甲苯)  |                 |                            |
| Ethyl benzene (乙苯)   |                 |                            |
| Propyl benzene (丙苯)  |                 |                            |
| Isopropyl benzene (異丙苯)  |                 |                            |
| Diethyladipate (己二酸二(2-乙基己基)酯)   | GC/MS           | —                          |
| Phthalates (DBP, DEHP, DNOP, DINP, DIDP, BBP)<br>(鄰苯二甲酸酯)  | GC/MS           | IEC 62321-8                |
| Nitrosamines (亞硝胺)   | GC/MS           | BS EN12868                 |
|  | GC/MS           | BS 7115                    |
|  | GC/MS           | ASTM F1313-90(99)          |
|  | GC/MS           | FDA CPG 7117.11            |
| Organophosphates (TMP, TBP, TPP) (有機磷化合物)  | GC/MS           | —                          |
| Epichlorohydrin (環氧氯丙烷)  | GC/MS/headspace | USEPA5021                  |
| Ethylene thiourea (環亞乙基硫尿)   | GC/MS/headspace | —                          |
| tri-tertiary-butylphenol   | GC/MS           | —                          |
| 抗氧化劑 (BHT)   | GC/MS           | ASTM 4275-91               |
| Chlorofluorocarbon (CFCs) (氟氯烷碳化物)<br>Class I / Group I & III  | GC/MS/headspace | 3093/94/EEC<br>USEPA 8260B |
| Hydrochlorofluorocarbon (HCFCs) (氟氯氫烷碳化物)<br>Class II  |                 |                            |
| Halon (海龍) Class I / Group II  |                 |                            |
| Carbon Tetrachloride (CCl <sub>4</sub> ) (四氯化碳) Class I /<br>Group IV  |                 |                            |
| Methyl chloroform = 1,1,1-Trichloroethane (CH <sub>3</sub> CCl <sub>3</sub> ) (1,1,1-<br>三氯乙烷) Class I / Group V |                 |                            |
| Bromomethane (CH <sub>3</sub> Br) (溴代甲烷) Class I / Group VI  |                 |                            |
| Hydrobromofluorocarbon (HBFC)  |                 |                            |



# 環境有害物質之檢測方法

## Test Methods of Environmental Hazardous Substances

| Test Item                               | Equipment       | Method Used                |
|---|-----------------|----------------------------|
| Hydrofluorocarbon (HFC)                 | GC/MS/headspace | 3093/94/EEC<br>USEPA 8260B |
| Perfluorocarbon (PFC)                   |                 |                            |
| Chlorinated hydrocarbons (CHCs) (氯碳氫化物) |                 |                            |
| 1,1,2-trichloroethane (1,1,2-三氯乙烷)      | GC/MS/headspace | USEPA5021                  |
| 1,2-dichloroethane (1,2-二氯乙烷)           |                 |                            |
| 1,1-dichloroethane (1,1-二氯乙烷)           |                 |                            |
| 1,2-dichloroethylene (1,2-二氯乙烯)         |                 |                            |
| Dichloromethane (二氯甲烷)                  |                 |                            |
| Chloroform (氯仿/三氯甲烷)                    |                 |                            |
| Trichloroethylene (三氯乙烯)                |                 |                            |
| Tetrachloroethylene (四氯乙烯)              |                 |                            |
| Diethylamine (二乙胺)                      | GC/MS           | —                          |
| Dimethylamine (二甲胺)                     | GC/MS           | —                          |
| Ethylene Glycol ethers (乙二醇乙醚)          | GC/MS           | —                          |
| Dienthylene glycol (DEG) (二乙二醇)         | GC/MS           | —                          |
| Dimethylamide acetate (DMAC) (乙酸二甲基胺脂)  | GC/MS           | —                          |
| Ethyl acetate (EA) (乙酸乙酯)               | GC/MS           | —                          |
| Ethylene glycol (EG) (乙二醇)              | GC/MS           | —                          |
| Methanol (甲醇)                           | GC/MS           | —                          |
| Methyl tert-butyl ether (MTBE) (甲基丁基醚)  | GC/MS           | —                          |
| n-Hexane (正己烷)                          | GC/MS           | EPA 5021A-2003             |
| Triethylene glycol (三乙二醇)               | GC/MS           | —                          |
| Phenol (酚)                              | GC/MS           | —                          |
| 2-ethoxyrthanol                         | GC/MS           | —                          |
| 2-ethoxyethyl acetate                   | GC/MS           | —                          |
| 2-methoxyethanol                        | GC/MS           | —                          |
| 2-methoxyethyl acetate                  | GC/MS           | —                          |
| Diethylene glycol dimethyl ether        | GC/MS           | —                          |
| Acrylamide monomer (丙烯醯胺單體)             | GC/MS           | Headspace & GC/MS          |
| Acrylonitrile monomer (丙烯晴單體)           | GC/MS           | Headspace & GC/MS          |
| Ethylene oxide monomer (環氧乙烷單體)         | GC/MS           | Headspace & GC/MS          |
| Phenol monomer (酚單體)                    | GC/MS           | USEPA3540/USEPA8270D       |
|   | GC/MS/headspace | USEPA5021                  |



# 環境有害物質之檢測方法

## Test Methods of Environmental Hazardous Substances

| Test Item  | Equipment         | Method Used                            |
|--|-------------------|--|
| Styrene monomer (苯乙烯單體)                              | GC/MS             | FDA 177.1640                           |
|  | GC/MS             | Headspace & GC/MS                      |
| Vinyl chloride monomer (氯乙烯單體)                       | GC/MS             | ASTM D3749-93                          |
| (N,N) - dimethylacetamide (二甲基乙醯胺)                   | GC/MS             | —                                      |
| (N) - Methylacetamide (甲基乙醯胺)                        | GC/MS             | —                                      |
| (N,N) - demethylformamide (二甲基甲醯胺)                   | GC/MS             | —                                      |
| (N) - Methylformamide (甲基甲醯胺)                        | GC/MS             | —                                      |
| Formaldehyde (福馬林)(甲醛)                               | UV,<br>HPLC       | EN120,EN717-1<br>JIS A 5905,JIS A 5908 |
| Asbestos (石綿)  | FT-IR             | 83/478/EEC, 85/610/EEC                 |
| Specific Azo Compounds (特定偶氮化合物) (22項)               | GC/MS             | EN14362-1,EN14362-2<br>ISO TS17234     |
| Polyvinylchloride (PVC) (聚氯乙烯)                       | FT-IR             | FT-IR                                  |
| Organo-tin compounds (有機錫化合物)                        | GC/FPD/MS         | DIN 38407-13                           |
| Polycyclic Aromatic Hydrocarbons (多環芳香族烴)            | GC/MS             | USEPA8270D                             |
| Cresol (甲酚)  | GC/MS             | —                                      |
| Polychlorinated phenols (多氯酚)                        | GC/MS             | —                                      |
| PFOS (全氟辛烷磺酸)  | LC/MS             | EPA 3540C                              |
| Specific Benzotriazole (特定苯並三氮唑)                     | HPLC              | EPA 3540                               |
| HBCD (六溴環十二烷)  | HPLC              | EPA 3540                               |
| Br(Bromine)  | IC                | SE-486,EN50267                         |
| Cl(Chlorine)   | IC                | SE-486,EN50267                         |
| PAHs   | LC/MS/MS          | ZEK 01-08                              |
| Cobalt dichloride(二氯化鈷)                              | ICP-AES           | EPA 3052                               |
| DMF ( dimethyl fumarate ) 富馬酸二甲酯                     | GC/MS             | EPA3550,EPA8270D                       |
| 紅磷(Red Phosphorus)、黃磷(Yellow Phosphorus)             | GC-MS             | EPA 3050B, 3051A, 3054                 |
| 聯苯胺和聯苯胺二鹽酸鹽(Benzidine and benzidine dihydrochloride) | —                 | —                                      |
| 六氯丁二烯Hexachlorobutadiene                             | —                 | —                                      |
| 甲苯(Toluene)  | GC-MS/<br>HPLC-MS | EPA 3550C-2007<br>EPA 8260C-2006       |
|  | GC-MS/<br>HPLC-MS | EPA 3550C-2007<br>EPA 8260C-2006       |
| N-甲基吡咯烷酮N-methylpyrrolidone (NMP)                    | GC-MS/<br>HPLC-MS | EPA 3550C-2007<br>EPA 8260C-2006       |

| 化學物質 (Chemical Substances)              |   | Limit(ppm)<br>RoHS2.0<br>(GP)無鉛 | Limit(ppm)<br>HF(無鹵) | Test Report<br>檢測報告 | Exemptions<br>是否有<br>排外項目 |
|---|---|---------------------------------|----------------------|---------------------|---------------------------|
| 金屬元素(Metals)                            | 鎘(Cd)                                     | 5                               | 5                    | Y                   | Y                         |
|   | 鉛(Pb)                                     | 90                              | 90                   | Y                   | Y                         |
|   | 汞(Hg)                                     | N.D                             | N.D                  | Y                   | Y                         |
|   | 六價鉻 (Cr <sup>6+</sup> )                   | N.D                             | N.D                  | Y                   | Y                         |
|   | 鈹以及鈹化合物(Be)                               | 1000                            | 1000                 |                     | Y                         |
|   | 鎳(Ni)                                     | N.D                             | N.D                  |                     | Y                         |
|   | 銻以及銻化合物(Sb)                               | 1000                            | 1000                 |                     | Y                         |
|   | 砷(As)以及砷化合物                               | 10                              | 10                   |                     | Y                         |
| 溴化合物<br>Bromide                         | 多溴聯苯(PBB)                                 | N.D                             | N.D                  | Y                   |                           |
|   | 多溴二苯醚(PBDE)                               | N.D                             | N.D                  | Y                   |                           |
|   | 四溴丙二酚-A(TBBP-A)                           | N.D                             | N.D                  |                     | Y                         |
|   | 六溴環十二烷(HBCDD)                             | N.D                             | N.D                  |                     |                           |
|   | 溴系阻燃劑(BFRs)                               | 900                             | 900                  |                     | Y                         |
|   | 其他溴化合物<br>(Other brominated<br>compounds) | -                               | 900                  |                     | Y                         |
| 氯化物<br>Chloride                         | 多氯聯苯(PCB)                                 | N.D                             | N.D                  |                     |                           |
|   | 多氯化萘(PCN)                                 | N.D                             | N.D                  |                     |                           |
|   | 多氯三聯苯(PCT)                                | N.D                             | N.D                  |                     |                           |
|   | 氯化石蠟(氯化烷烴)(CP)                            | N.D                             | N.D                  |                     |                           |
|   | 聚氯乙炔(PVC) &<br>聚氯乙炔混合物                    | N.D                             | N.D                  |                     | Y                         |
|   | 二氯化鈷(Cobalt Dichloride)                   | N.D                             | N.D                  |                     | Y                         |
|   | 氯系阻燃劑(CFRs)                               | -                               | 900                  |                     | Y                         |
|   | 氯化烴類<br>(Chlorinated Hydrocarbons)        | 1000                            | 1000                 |                     |                           |
|   | 其他氯化物<br>(Other chlorinated compounds)    | -                               | 900                  |                     | Y                         |
|   | 五氯酚(PCP)                                  | N.D                             | N.D                  |                     |                           |
|   | 五氯硫酚(PCTP)                                | N.D                             | N.D                  |                     |                           |
|   | 異內基吡嗪 酸二苯酯 PIP<br>(2,1)                   | N.D                             | N.D                  |                     |                           |
| 氟化合物(Fluoride)                          | 全氟辛烷硫磺酸(PFOS)                             | N.D                             | N.D                  |                     |                           |
|   | 全氟辛烷磺醯氟 (POSF)                            | N.D                             | N.D                  |                     |                           |
|   | 全氟辛烷酸(PFOA)                               | N.D                             | N.D                  |                     |                           |
|   | 全氟/多氟烷基物質(PFAS)                           | N.D                             | N.D                  |                     |                           |
|   | 長鏈全氟烷基羧酸鹽(LCPFAC)                         | N.D                             | N.D                  |                     |                           |
|   | 全氟羧酸C9-C14 PFCA 物質                        | N.D                             | N.D                  |                     |                           |
| 含氟溫室氣體(Fluorinated<br>Greenhouse Gases) | N.D                                       | N.D                             |                      |                     |                           |
| 放射性物質 (Radioactive Substances)          | N.D                                       | N.D                             |                      |                     |                           |
| 有機錫化合物(TBT、TPT、TBTO、DBT、DOT)            | N.D                                       | N.D                             |                      |                     |                           |
| 石棉(Asbestos)                            | N.D                                       | N.D                             |                      |                     |                           |
| 偶氮化合物(Azo compounds)                    | N.D                                       | N.D                             |                      |                     |                           |
| 聯苯胺和聯苯胺二鹽酸鹽(Benzidine)                  | N.D                                       | N.D                             |                      |                     |                           |
| 甲醛(Formaldehyde)                        | N.D                                       | N.D                             |                      |                     |                           |
| 發泡聚苯乙烯(EPS)                             | N.D                                       | N.D                             |                      | Y                   |                           |
| 臭氧層危害物質(Ozone depleting substances)     | N.D                                       | N.D                             |                      |                     |                           |
| 鹵化二苯基甲烷 (Ugilec141;Ugilec121;DBBT)      | N.D                                       | N.D                             |                      |                     |                           |
| 鄰苯二甲酸酯-1(DEHP、DBP、BBP、DIBP)             | 1000                                      | 1000                            | Y                    |                     |                           |
| 鄰苯二甲酸酯-2(DINP、DIDP、DNOP)                | 1000                                      | 1000                            |                      | Y                   |                           |
| 多環芳香烴化合物(PAHs)                          | 0.2                                       | 0.2                             |                      | Y                   |                           |
| 氣味物質(二甲苯麝香及酮麝香)Fragrance substance      | 500                                       | 500                             |                      |                     |                           |



| 化學物質 (Chemical Substances)                                    |   | Limit(ppm)<br>RoHS2.0<br>(GP)無鉛 | Limit(ppm)<br>HF(無鹵) | Test Report<br>檢測報告 | Exemptions<br>是否有<br>排外項目 |
|---|---|---------------------------------|----------------------|---------------------|---------------------------|
| 紅磷(Red Phosphorus), 黃磷 (Yellow Phosphorus)                    |   | N.D                             | N.D                  |                     |                           |
| 富馬酸二甲酯 (dimethyl fumarate, 簡稱DMF)                             |   | N.D                             | N.D                  |                     |                           |
| 有機磷化合物(TCPP、TCEP、TDCPP)                                       |   | 1000                            | 1000                 |                     |                           |
| 2-(2H)-苯并三氮唑-2-基)-4,6-双(1,1-二甲基乙基)苯酚 苯酚 (UV-320)              |   | N.D                             | N.D                  |                     |                           |
| 壬基酚與壬基酚聚氧乙烯醚及相關物質(NP/NPEs)                                    |   | N.D                             | N.D                  |                     |                           |
| 烷基酚(Alkylphenols)   |   | N.D                             | N.D                  |                     |                           |
| 2,4,6 三-叔丁基苯酚 (2,4,6-Tri-tert-butylphenol)                    |   | N.D                             | N.D                  |                     |                           |
| 三(2,3-二溴丙基) 磷酸酯 Tri-(2,3-dibromo-propyl phosphate)            |   | N.D                             | N.D                  |                     |                           |
| 三吡啶基氧化磷 Tris-(1-aziridinyl) phosphin oxide                    |   | N.D                             | N.D                  |                     |                           |
| 苯(Benzene)  |   | N.D                             | N.D                  |                     |                           |
| 正己烷(n-Hexane)   |   | N.D                             | N.D                  |                     |                           |
| 二苯胺、苯乙烯和 2,4,4-三甲基戊烯的反應產物- (BNST)                             |   | N.D                             | N.D                  |                     | Y                         |
| 六氯丁二烯(Hexachlorobutadiene)HCBD<br>六氯苯 Hexachlorobenzene (HCB) |   | N.D                             | N.D                  |                     |                           |
| 甲苯(Toluene)   |   | 100                             | 100                  |                     |                           |
| N-甲基吡咯烷酮N-methylpyrrolidone (NMP)                             |   | 100                             | 100                  |                     |                           |
| 三氧化二砷、五氧化二砷(Diarsenic trioxide,Diarsenic pentaoxide)          |   | 10                              | 10                   |                     | Y                         |
| 高氯酸鹽類(Perchlorates)   |   | -                               | -                    |                     | Y                         |
| 1-溴丙烷n-Propyl Bromide (nPB)                                   |   | 100                             | 100                  |                     |                           |
| 礦物油芳香烴(MOAH)及礦物油飽和烴(MOSH)                                     |   | 1                               | 1                    |                     | Y                         |
| 紫外線吸收劑328 (UV-328)  |   | N.D                             | N.D                  |                     |                           |
| REACH   |   | 1000                            | 1000                 |                     | Y                         |
| 包材<br>(Rules for packaging materials)                         | 全氟/多氟烷基物質(PFAS)                           | N.D                             | N.D                  |                     |                           |
|   | 鄰苯二甲酸酯加總<100ppm<br>Phthalates Sum <100ppm | 100                             | 100                  |                     |                           |
|   | Pb+Cd+Hg+Cr6<100ppm<br>(Cd<5ppm)          | 100                             | 100                  |                     | Y                         |
| 電池指令 (Rules for batteries)                                    | 鎘(Cd)                                     | -                               | 0.5                  | Y                   |                           |
|   | 鉛(Pb)                                     | -                               | 4                    | Y                   |                           |
|   | 汞(Hg)                                     | -                               | 0.1                  | Y                   |                           |
| 無鹵管制項目<br>(Halogen Free Control substances)                   | 溴(Bromine) (Br)                           | -                               | 900                  | Y                   | Y                         |
|   | 氯(Chlorine) (Cl)                          | -                               | 900                  | Y                   | Y                         |
|   | 溴(Br)+氯(Cl)                               | -                               | 1500                 | Y                   | Y                         |
|   | 三氧化二銻 (Sb2O3)                             | -                               | 1000                 |                     |                           |
| 磷酸三苯酯 (TPP)   | -   | N.D                             |                      |                     |                           |
| 中國揮發性有機物<br>(China VOCs)                                      | 塗料(Coating)                               | GB 30981-2020                   |                      | Y                   |                           |
|   | 油墨(Ink)                                   | GB 38507-2020                   |                      | Y                   |                           |
|   | 膠黏劑(Adhesive)                             | GB 33372-2020                   |                      | Y                   |                           |
|   | 清洗劑(Cleaning agents)                      | GB 38508-2020                   |                      | Y                   |                           |

Note:1.管制外項目詳細資料請參考文件 DOC.NO. E00-ST-004.附件4 有害物質之分級及要求[Exemptions see Hazardous substances classification(annex 4)]

2.UMEC供應商於提出限用物質(HSF)承諾書時除應提出上列檢驗項目之檢測報告並應充分了解UMEC文件[產品限用物質(HSF)管理規範]

(DOC.NO. E00-ST-004)中之相關限用物質規範並於產品及製作過程中注意禁用。

UMEC suppliers must need to provide inspection report as above examine items when to address RoHS commitment, and adequate understand the limit of UMEC's document [RoHS management norm](DOC.NO. E00-ST-004) in the products and process of manufacture.



## REACH 符合性宣告

REACH Regulation(EC )No 1907/2006 of the European Parliament and the European Council concerning the Registration, Evaluation, Authorization and Restriction of Chemical substances,entered into force, on 2007, June 1st

歐洲議會及理事會關於在2007年6月1日對於化學品注冊，評估，授權，限制的 (EC ) 1907/2006號 法規；

The European Chemicals Agency (ECHA) announced that all new substances previously proposed as Substances of Very High Concern (SVHC) have been added to the Candidate List. We ask the vendor should review the information on website

<http://echa.europa.eu/web/guest/candidate-list-table> at least twice a year. To confirm and can meet that the SVHCs update.

歐盟化學總署每年會正式公告新的高度關注物質並且納入歐盟化學總署公告的高度關注物質清單中。請供應商每年定期(至少2次)至此網址：<http://echa.europa.eu/web/guest/candidate-list-table> 確認高度關注度物質清單是否更新,且符合要求。

As a potential or current supplier of UMEC, our company is responsible for ensuring full compliance with REACH Regulation Requirement. We hereby warrants and guarantees that all of our products to UMEC can meet item 1 (Note:Please fill 1 or 2, if meet item 2, please fill SVHC concentration in below table)

作為UMEC的潛在或已有供應商，本公司有責任完全滿足REACH法規要求。本公司交至UMEC之所有零部件中REACH SVHC的含有情況滿足以下第1項(請填入1或2, 選第2項請填寫下表SVHC含量)。

- 1 所有產品均質中SVHC含量不超過1000ppm (All of product contain SVHC <1000ppm)
- 2 部分零件均質含有SVHC，且含量大于1000ppm，請參考下表。(Some of our product contain SVHC ,and SVHC >1000ppm, please refer to below table)

Table 1: Informaiton of SVHC, contain above 1000ppm(SVHC含有狀況,SVHC大于1000ppm)

| No. | UMEC parts number | Manufacturer part number | Weight of Product (mg) | Name of SVHC Contained | CAS No. of SVHC | Concentration (ppm:SVHC/Product weight) | Description of use |
|-----|-------------------|--------------------------|------------------------|------------------------|-----------------|---|--------------------|
| 1   |                   |                          |                        |                        |                 |   |                    |
| 2   |                   |                          |                        |                        |                 |   |                    |
| 3   |                   |                          |                        |                        |                 |   |                    |

[供應商名稱Supplier Name]: \_\_\_\_\_

[地址Address]: \_\_\_\_\_

[簽名 Signature]: \_\_\_\_\_

[Company Seal]: \_\_\_\_\_

When REACH regulation updated and the product contains SVHC more than 1000ppm. Please provide us with updated declaration once new SVHC are added in the candidate list. Supplier is deemed to fully comply with the REACH regulation if no updated declaration is provided, and should bear the consequences.

當REACH法規更新且產品均質含有SVHC超過1000ppm時，供應商應及時提供最新聲明給UMEC,未及時提供視為完全符合REACH法規要求,相關後果由供應商承擔。

| 項次<br>Serial | 版本<br>Version   | 物質名稱(英)<br>Substance Name(En)   | 物質名稱(中)<br>Substance Name(Ch) |
|--------------|-----------------|---|-------------------------------|
| 235          | REACH SVHC_V.29 | Bis(4-chlorophenyl) sulphone  | 4,4'-二氯二苯砜                    |
| 234          | REACH SVHC_V.29 | Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide   | (2,4,6-三甲基苯甲酰基)二苯基氧化膦         |
| 233          | REACH SVHC_V.28 | reaction mass of 2,2,3,3,5,5,6,6-octafluoro-4-(1,1,1,2,3,3,3-heptafluoropropan-2-yl)morpholine and 2,2,3,3,5,5,6,6-octafluoro-4-(heptafluoropropyl)morpholine |                               |
| 232          | REACH SVHC_V.28 | Perfluoroheptanoic acid and its salts   |                               |
| 231          | REACH SVHC_V.28 | Melamine  | 三聚氰胺                          |
| 230          | REACH SVHC_V.28 | Isobutyl 4-hydroxybenzoate  | 4-羥基苯甲酸 2-甲基丙酯                |
| 229          | REACH SVHC_V.28 | bis(2-ethylhexyl) tetrabromophthalate covering any of the individual isomers and/or combinations thereof  |                               |
| 228          | REACH SVHC_V.28 | Barium diboron tetraoxide   | 偏硼酸鋇                          |
| 227          | REACH SVHC_V.28 | 4,4'-sulphonyldiphenol  | 雙酚S                           |
| 226          | REACH SVHC_V.28 | 2,2',6,6'-tetrabromo-4,4'-isopropylidenediphenol  | 四溴雙酚(TBBP-A/TBBA)             |
| 225          | REACH SVHC_V.28 | 1,1'-[ethane-1,2-diylbis(oxy)]bis[2,4,6-tribromobenzene]  | 1,2-雙(2,4,6-三溴苯氧基)乙烷          |
| 224          | REACH SVHC_V.27 | N-(hydroxymethyl)acrylamide   | N-羥甲基-2-丙烯醯胺                  |
| 223          | REACH SVHC_V.26 | tris(2-methoxyethoxy)vinyl  | 6-乙氧基-6-(2-甲氧基                |
| 222          | REACH SVHC_V.26 | S-(tricyclo(5.2.1.0'2,6)deca  |                               |
| 221          | REACH SVHC_V.26 | 6,6'-di-tert-butyl-2,2'-met   | 雙(2-羥基-3-叔丁基-                 |
| 220          | REACH SVHC_V.26 | (±)-1,7,7-trimethyl-3-[(4-  |                               |
| 219          | REACH SVHC_V.25 | Phenol, alkylation products   |                               |
| 218          | REACH SVHC_V.25 | Orthoboric acid, sodium sa  |                               |
| 217          | REACH SVHC_V.25 | Medium-chain chlorinated  | 中鏈氯化石蠟                        |
| 216          | REACH SVHC_V.25 | Glutaral  | 戊二醛                           |
| 215          | REACH SVHC_V.25 | 4,4'-(1-methylpropylidene)  |                               |
| 214          | REACH SVHC_V.25 | 2-(4-tert-butylbenzyl)prop  |                               |
| 213          | REACH SVHC_V.25 | 2,2-bis(bromomethyl)propa   |                               |
| 212          | REACH SVHC_V.25 | 1,4-Dioxane   | 1,4-二氧六環                      |
| 211          | REACH SVHC_V.24 | Diocyltin dilaurate, stanna   |                               |
| 210          | REACH SVHC_V.24 | Bis(2-(2-methoxyethoxy)et   | 四甘醇二甲醚                        |
| 209          | REACH SVHC_V.23 | Dibutylbis(pentane-2,4-dio  | 雙乙醯丙酮基二丁基鎂                    |
| 208          | REACH SVHC_V.23 | Butyl 4-hydroxybenzoate   | 對羥基苯甲酸丁酯                      |
| 207          | REACH SVHC_V.23 | 2-Methylimidazole   | 2-甲基咪唑                        |
| 206          | REACH SVHC_V.23 | 1-Vinylimidazole  | 1-乙炔基咪唑                       |
| 205          | REACH SVHC_V.22 | Perfluorobutane sulfonic ac   | 全氟丁烷磺酸及其鹽類                    |
| 204          | REACH SVHC_V.22 | Diisohexyl phthalate  | 鄰苯二甲酸二異己酯                     |
| 203          | REACH SVHC_V.22 | 2-Methyl-1-(4-methylthio  | 2-甲基-1-[4-(甲基硫                |
| 202          | REACH SVHC_V.22 | 2-benzyl-2-dimethylamino  | 2-苄基-2-二甲氨基-4                 |
| 201          | REACH SVHC_V.21 | Tris(4-nonylphenyl, branch  | 三(4-壬苯基,支鏈及直                  |
| 200          | REACH SVHC_V.21 | 4-Tert-Butylphenol  | 對叔丁基苯酚                        |
| 199          | REACH SVHC_V.21 | 2-methoxyethyl acetate  | 乙二醇甲醚乙酸酯                      |

|     |                   |                               |                   |
|-----|-------------------|-------------------------------|-------------------|
| 198 | REACH SVHC_V.21   | 2,3,3,3-tetrafluoro-2-(hept   | 2,3,3,3-四氟-2-(七氟丙 |
| 197 | REACH SVHC_V.20   | Pyrene                        | 芘; 氘代芘            |
| 196 | REACH SVHC_V.20   | Phenanthrene                  | 菲                 |
| 195 | REACH SVHC_V.20   | Fluoranthene                  |                   |
| 194 | REACH SVHC_V.20   | Benzo[k]fluoranthene          | 苯(k)苯駢            |
| 193 | REACH SVHC_V.20   | 2,2-Bis(4'-hydroxyphenyl)-    | 4,4'-(1,3-二甲基丁基)  |
| 192 | REACH SVHC_V.20   | 1,7,7-trimethyl-3-(phenylm    | 1,7,7-三甲基-3-(苯亞   |
| 191 | REACH SVHC_V.19   | Terphenyl, hydrogenated       | 氫化三聯苯             |
| 190 | REACH SVHC_V.19   | Octamethylcyclotetrasiloxa    | 八甲基環四矽氧烷          |
| 189 | REACH SVHC_V.19   | Lead(Pb)                      | 鉛(Pb)             |
| 188 | REACH SVHC_V.19   | Ethylenediamine               | 乙二胺               |
| 187 | REACH SVHC_V.19   | Dodecamethylcyclohexasilox    | 十二甲基環六矽氧烷         |
| 186 | REACH SVHC_V.19   | Disodium octaborate           | 八硼酸二鈉             |
| 185 | REACH SVHC_V.19   | Dicyclohexyl phthalate        | 鄰苯二甲酸二環己酯(D       |
| 184 | REACH SVHC_V.19   | Decamethylcyclopentasilox     | 十甲基環五矽氧烷          |
| 183 | REACH SVHC_V.19   | Benzo[ghi]perylene            | 苯並(g,h,i)芘        |
| 182 | REACH SVHC_V.19   | Benzene-1,2,4-tricarboxyli    | 偏苯三酸酐             |
| 181 | REACH SVHC_V.18   | Reaction products of 1,3,4-   | 1,3,4-噁二唑-2,5-二硫  |
| 180 | REACH SVHC_V.18   | Chrysene                      | 蒽                 |
| 179 | REACH SVHC_V.18   | Cadmium Nitrate               | 硝酸鎘               |
| 178 | REACH SVHC_V.18   | Cadmium Hydroxide             | 氫氧化鎘              |
| 177 | REACH SVHC_V.18   | Cadmium carbonate             | 碳酸鎘               |
| 176 | REACH SVHC_V.18   | Benz[a]anthracene             | 苯並[a]蔥            |
| 175 | REACH SVHC_V.18   | 1,6,7,8,9,14,15,16,17,17,18,1 | 得克隆[包括所有反式        |
| 174 | REACH SVHC_V.17   | Perfluorohexane-1-sulphor     |                   |
| 173 | REACH SVHC_V.16   | P-(1,1-Dimethylpropyl)phe     | 對-(1,1-二甲基丙基)苯    |
| 172 | REACH SVHC_V.16   | Nonadecafluorodecanoic ac     | 十九氟癸酸及其鈉和鎘        |
| 171 | REACH SVHC_V.16   | 4-heptylphenol, branched a    | 4-庚基苯酚, 支鏈及直      |
| 170 | REACH SVHC_V.16   | 4,4'-Isopropylidenediphenol   | 雙酚A               |
| 169 | REACH SVHC_V.1~15 | Benzo[def]chrysene (Benz      | 苯並(a)芘            |
| 168 | REACH SVHC_V.1~15 | Perfluorononan-1-oic-acid     |                   |
| 167 | REACH SVHC_V.1~15 | Nitrobenzene                  | 硝苯                |
| 166 | REACH SVHC_V.1~15 | 2-(2H-benzotriazol-2-yl)-4    | 2-(2H-苯並三唑-2-基    |
| 165 | REACH SVHC_V.1~15 | 2,4-di-tert-butyl-6-(5-chlo   | 2,4-貳三級丁基-6-(5-   |
| 164 | REACH SVHC_V.1~15 | 1,3-Propanesultone            | 1,3-丙磺內酯          |
| 163 | REACH SVHC_V.1~15 | 5-sec-butyl-2-(2,4-dimeth     | 5-二級丁基-2-(2,4-二   |
| 162 | REACH SVHC_V.1~15 | 1,2-Benzenedicarboxylic ac    | 1,2-苯二甲酸二C6-10    |
| 161 | REACH SVHC_V.1~15 | Reaction mass of 2-ethylh     | 10-乙基-4,4-二辛基-    |
| 160 | REACH SVHC_V.1~15 | Cadmium sulphate              | 硫化鎘               |
| 159 | REACH SVHC_V.1~15 | Cadmium fluoride              | 氟化鎘               |
| 158 | REACH SVHC_V.1~15 | 2-ethylhexyl 10-ethyl-4,4-    | 10-乙基-4,4-二辛基-    |
| 157 | REACH SVHC_V.1~15 | 2-benzotriazol-2-yl-4,6-di    | 2-(2H-1,2,3-苯並三唑  |
| 156 | REACH SVHC_V.1~15 | 2-(2H-benzotriazol-2-yl)-4    | 2-(2H-苯並三唑-2-基    |
| 155 | REACH SVHC_V.1~15 | Sodium peroxometaborate       | 過硼酸鈉              |
| 154 | REACH SVHC_V.1~15 | Sodium perborate, perboric    | 過硼酸鈉              |
| 153 | REACH SVHC_V.1~15 | Cadmium chloride              | 氯化鎘               |
| 152 | REACH SVHC_V.1~15 | 1,2-Benzenedicarboxylic ac    | 支鏈和直鏈的1,2-苯二      |
| 151 | REACH SVHC_V.1~15 | Trixylyl phosphate            | 磷酸三(二甲苯)酯         |
| 150 | REACH SVHC_V.1~15 | Lead di(acetate)              | 醋酸鉛               |
| 149 | REACH SVHC_V.1~15 | Imidazolidine-2-thione (2-i   | 伸乙硫脲(咪唑啉-2-硫      |
| 148 | REACH SVHC_V.1~15 | Disodium 4-amino-3-[[4'-      | 直接黑 38            |
| 147 | REACH SVHC_V.1~15 | Disodium 3,3'-[[1,1'-biphen   | 直接紅 28            |
| 146 | REACH SVHC_V.1~15 | Dihexyl phthalate(DNHP)       | 鄰苯二甲酸二己酯(DN       |
| 145 | REACH SVHC_V.1~15 | Cadmium sulphide              | 硫化鎘               |
| 144 | REACH SVHC_V.1~15 | Pentadecafluorooctanoic a     | 全氟辛酸(PFOA)        |
| 143 | REACH SVHC_V.1~15 | Dipentyl phthalate (DPP)      | 鄰苯二甲酸二戊酯(DP       |
| 142 | REACH SVHC_V.1~15 | Cadmium oxide                 | 氧化鎘               |
| 141 | REACH SVHC_V.1~15 | Cadmium(Cd)                   | 鎘(Cd)             |
| 140 | REACH SVHC_V.1~15 | Ammonium pentadecafluor       | 全氟辛酸銨(APFO)       |

|     |                   |                                       |                                |
|-----|-------------------|---------------------------------------|--------------------------------|
| 139 | REACH SVHC_V.1~15 | 4-Nonylphenol, branched a             | 分支或線性的壬基酚,                     |
| 138 | REACH SVHC_V.1~15 | Trilead dioxide phosphonat            | 二鹼式亞磷酸鉛                        |
| 137 | REACH SVHC_V.1~15 | Trilead bis(carbonate) dihy           | 鹼式碳酸鉛                          |
| 136 | REACH SVHC_V.1~15 | Tricosafuorododecanoic ac             | 全氟十二酸(PFDoDA)                  |
| 135 | REACH SVHC_V.1~15 | Tetralead trioxide sulphate           | 三鹼式硫酸鉛                         |
| 134 | REACH SVHC_V.1~15 | Tetraethyllead                        | 四乙基鉛                           |
| 133 | REACH SVHC_V.1~15 | Sulfurous acid, lead salt, di         | 亞硫酸鉛(II)                       |
| 132 | REACH SVHC_V.1~15 | Silicic acid, lead salt               | 矽酸鉛                            |
| 131 | REACH SVHC_V.1~15 | Silicic acid (H2Si2O5), bari          | 摻雜鉛的矽酸鋇                        |
| 130 | REACH SVHC_V.1~15 | Pyrochlore, antimony lead             | 顏料黃41                          |
| 129 | REACH SVHC_V.1~15 | Pentalead tetraoxide sulph            | 硫酸四氧化五鉛                        |
| 128 | REACH SVHC_V.1~15 | Pentacosafuorotridecanoic             | 全氟十三酸(PFTrDA)                  |
| 127 | REACH SVHC_V.1~15 | Orange lead (lead tetroxide)          | 四氧化三鉛(鉛丹)                      |
| 126 | REACH SVHC_V.1~15 | O-Toluidine                           | 鄰-甲苯胺                          |
| 125 | REACH SVHC_V.1~15 | O-aminoazotoluene                     | 鄰-胺基偶氮甲苯                       |
| 124 | REACH SVHC_V.1~15 | n-pentyl-isopentyl phthalat           | 鄰苯二甲酸正戊基異戊                     |
| 123 | REACH SVHC_V.1~15 | N-methylacetamide                     | N-甲基乙醯胺                        |
| 122 | REACH SVHC_V.1~15 | N,N-Dimethylformamide                 |                                |
| 121 | REACH SVHC_V.1~15 | Methyloxirane (Propylene d            | 環氧丙烷                           |
| 120 | REACH SVHC_V.1~15 | Methoxyacetic acid                    | 甲氧基乙酸                          |
| 119 | REACH SVHC_V.1~15 | Lead titanium zirconium ox            | 鉛鈦鉛氧化物                         |
| 118 | REACH SVHC_V.1~15 | Lead titanium trioxide                | 鈦酸鉛(II)                        |
| 117 | REACH SVHC_V.1~15 | Lead oxide sulfate                    | 鹼式硫酸鉛                          |
| 116 | REACH SVHC_V.1~15 | Lead monoxide (lead oxide)            | 氧化鉛(PbO);一氧化鉛                  |
| 115 | REACH SVHC_V.1~15 | Lead dinitrate                        | 硝酸鉛                            |
| 114 | REACH SVHC_V.1~15 | Lead cyanamidate                      | 氰胺化鉛                           |
| 113 | REACH SVHC_V.1~15 | Lead bis(tetrafluoroborate)           | 二(四氟硼酸)鉛                       |
| 112 | REACH SVHC_V.1~15 | Hexahydromethylphthalic a             |                                |
| 111 | REACH SVHC_V.1~15 | Heptacosafuorotetradecan              | 全氟十四酸(PFTeDA)                  |
| 110 | REACH SVHC_V.1~15 | Henicosafuoroundecanoic               | 全氟十一酸(PFUnDA)                  |
| 109 | REACH SVHC_V.1~15 | Furan                                 | 呋喃                             |
| 108 | REACH SVHC_V.1~15 | Fatty acids, C16-18, lead s           | C16-18-脂肪酸鉛鹽                   |
| 107 | REACH SVHC_V.1~15 | Dioxobis(stearato)trilead             | 雙(十八酸基)二氧代三                    |
| 106 | REACH SVHC_V.1~15 | Dinoseb (6-sec-butyl-2,4-             | 達諾殺                            |
| 105 | REACH SVHC_V.1~15 | Dimethyl sulphate                     | 硫酸二甲酯                          |
| 104 | REACH SVHC_V.1~15 | Diisopentyl phthalate(DIPP)           | 鄰苯二甲酸二異戊酯(D                    |
| 103 | REACH SVHC_V.1~15 | Diethyl sulphate                      | 硫酸二乙酯                          |
| 102 | REACH SVHC_V.1~15 | Dibutyltin dichloride (DBTC)          | 二氯化二丁錫(DBTC)                   |
| 101 | REACH SVHC_V.1~15 | Diazene-1,2-dicarboxamide             | 1,1'-偶氮雙甲醯胺                    |
| 100 | REACH SVHC_V.1~15 | Cyclohexane-1,2-dicarboxy             |                                |
| 099 | REACH SVHC_V.1~15 | Bis(pentabromophenyl) eth             | 十溴聯苯醚                          |
| 098 | REACH SVHC_V.1~15 | Biphenyl-4-ylamine                    | 4-胺基聯苯                         |
| 097 | REACH SVHC_V.1~15 | Acetic acid, lead salt, basic         | 鹼式乙酸鉛                          |
| 096 | REACH SVHC_V.1~15 | [Phthalato(2-)]dioxotrilead           | 二鹼式鄰苯二甲酸鉛                      |
| 095 | REACH SVHC_V.1~15 | 6-Methoxy-m-toluidine (p-             | 6-甲氧基-間-甲苯胺                    |
| 094 | REACH SVHC_V.1~15 | 4-Nonylphenol, branched a             | 分支或線性的壬基酚,                     |
| 093 | REACH SVHC_V.1~15 | 4-methyl-m-phenylenediam              | 4-甲基-間-苯二胺 (2                  |
| 092 | REACH SVHC_V.1~15 | 4-Aminoazobenzene                     | 4-胺基偶氮苯                        |
| 091 | REACH SVHC_V.1~15 | 4-(1,1,3,3-tetramethylbutyl           | 4-(1,1,3,3-四甲基丁基               |
| 090 | REACH SVHC_V.1~15 | 4,4'-Oxydianiline and its sa          |                                |
| 089 | REACH SVHC_V.1~15 | 4,4'-Methylenedi-o-toluidin           | 4,4'-亞甲基二-鄰-甲苯                 |
| 088 | REACH SVHC_V.1~15 | 3-Ethyl-2-methyl-2-(3-me              | 3-乙基-2-甲基-2-(3-                |
| 087 | REACH SVHC_V.1~15 | 1-Bromopropane (n-propyl)             | 1-溴丙烷                          |
| 086 | REACH SVHC_V.1~15 | 1,2-Diethoxyethane                    | 乙二醇二乙醚                         |
| 085 | REACH SVHC_V.1~15 | 1,2-Benzenedicarboxylic ac            | 支鏈和直鏈 1,2-苯二甲                  |
| 084 | REACH SVHC_V.1~15 | $\alpha, \alpha$ -Bis[4-(dimethylamin | C.I. 溶劑藍 4 $\alpha, \alpha$ -雙 |
| 083 | REACH SVHC_V.1~15 | N,N,N',N'-tetramethyl-4,4'            | 4,4'-亞甲基雙(N,N-二                |
| 082 | REACH SVHC_V.1~15 | Lead(II) bis(methanesulfona           | 甲基磺酸鉛                          |
| 081 | REACH SVHC_V.1~15 | Formamide                             | 甲醯胺                            |

|     |                   |                             |                     |
|-----|-------------------|-----------------------------|---------------------|
| 080 | REACH SVHC_V.1~15 | Diboron trioxide            | 氧化硼(B2O3)           |
| 079 | REACH SVHC_V.1~15 | [4-[[4-Anilino-1-naphthyl]  | C.I. 鹼性藍 26 ([4-[[4 |
| 078 | REACH SVHC_V.1~15 | [4-[4,4'-bis(dimethylamino) | 鹼性紫 3               |
| 077 | REACH SVHC_V.1~15 | 4,4'-bis(dimethylamino)ben  | 4,4'-二(N,N-二甲氨基)    |
| 076 | REACH SVHC_V.1~15 | 4,4'-Bis(dimethylamino)-4'' | 4,4'-雙(二甲基氨基)-      |
| 075 | REACH SVHC_V.1~15 | 1,3,5-tris[(2S and 2R)-2,3- | β型異氰尿酸三縮水甘          |
| 074 | REACH SVHC_V.1~15 | 1,3,5-Tris(oxiran-2-ylmethy | 異氰尿酸三縮水甘油           |
| 073 | REACH SVHC_V.1~15 | 1,2-bis(2-methoxyethoxy)e   | 三乙二醇二甲醚             |
| 072 | REACH SVHC_V.1~15 | 1, 2-dimethoxyethane; ethy  | 乙二醇二甲醚              |
| 071 | REACH SVHC_V.1~15 | Zirconia Aluminosilicate Re | 矽酸鋁氧化鋯,陶瓷耐          |
| 070 | REACH SVHC_V.1~15 | Trilead diarsenate          | 砷酸鉛                 |
| 069 | REACH SVHC_V.1~15 | Potassium hydroxyoctaexo    | 氫氧化鉻酸鋅鉀             |
| 068 | REACH SVHC_V.1~15 | Phenolphthalein             | 酚酞                  |
| 067 | REACH SVHC_V.1~15 | Pentazinc chromate octahy   | 鉻酸五鋅八氫氧化物           |
| 066 | REACH SVHC_V.1~15 | N,N-dimethylacetamide       | N,N-二甲基乙醯胺          |
| 065 | REACH SVHC_V.1~15 | Lead styphnate              | 史蒂芬酸鉛 或稱 2,4,6      |
| 064 | REACH SVHC_V.1~15 | Lead dipicrate              | 二苦味酸鉛               |
| 063 | REACH SVHC_V.1~15 | Lead diazide, Lead azide    | 疊氮化鉛                |
| 062 | REACH SVHC_V.1~15 | Formaldehyde, oligomeric r  | 甲醛與苯胺寡聚反應           |
| 061 | REACH SVHC_V.1~15 | Dichromium tris(chromate)   | 鉻酸鉻                 |
| 060 | REACH SVHC_V.1~15 | Calcium arsenate            | 砷酸鈣                 |
| 059 | REACH SVHC_V.1~15 | Bis(2-methoxyethyl) phtha   | 鄰苯二甲酸二(2-甲氧         |
| 058 | REACH SVHC_V.1~15 | Bis(2-methoxyethyl) ether   | 二乙二醇二甲醚             |
| 057 | REACH SVHC_V.1~15 | Arsenic acid                | 砷酸                  |
| 056 | REACH SVHC_V.1~15 | Aluminosilicate Refractory  | 矽酸鋁,陶瓷耐火纖維          |
| 055 | REACH SVHC_V.1~15 | 4-(1,1,3,3-Tetramethylbuty  | 4-三級辛基苯酚            |
| 054 | REACH SVHC_V.1~15 | 2-Methoxyaniline, o-Anisid  | 鄰-甲氧苯胺              |
| 053 | REACH SVHC_V.1~15 | 2,2'-dichloro-4,4'-methyler | 4,4'-亞甲雙(2-氯苯胺)     |
| 052 | REACH SVHC_V.1~15 | 1,2-dichloroethane          | 1,2-二氯乙烷            |
| 051 | REACH SVHC_V.1~15 | Strontium chromate          | 鉻酸鋇                 |
| 050 | REACH SVHC_V.1~15 | Hydrazine                   |                     |
| 049 | REACH SVHC_V.1~15 | 2-Ethoxyethyl acetate       | 乙二醇乙醚醋酸酯            |
| 048 | REACH SVHC_V.1~15 | 1-Methyl-2-pyrrolidone (N   | 1-甲基吡咯烷酮            |
| 047 | REACH SVHC_V.1~15 | 1,2-Benzenedicarboxylic ac  | 鄰苯二甲酸二(C7-11)       |
| 046 | REACH SVHC_V.1~15 | 1,2-Benzenedicarboxylic ac  | 鄰苯二甲酸二烷基酯(C         |
| 045 | REACH SVHC_V.1~15 | 1,2,3-Trichloropropane      | 1,2,3-三氯丙烷          |
| 044 | REACH SVHC_V.1~15 | Cobalt(II) sulphate         | 硫酸鈷(二價)             |
| 043 | REACH SVHC_V.1~15 | Cobalt(II) dinitrate        | 硝酸鈷(二價)             |
| 042 | REACH SVHC_V.1~15 | Cobalt(II) diacetate        | 醋酸鈷(二價)             |
| 041 | REACH SVHC_V.1~15 | Cobalt(II) carbonate        | 碳酸鈷(二價)             |
| 040 | REACH SVHC_V.1~15 | Chromium trioxide           | 三氧化鉻                |
| 039 | REACH SVHC_V.1~15 | Acids generated from chro   | 從三氧化鉻生成的酸類          |
| 038 | REACH SVHC_V.1~15 | 2-Methoxyethanol            | 乙二醇甲醚               |
| 037 | REACH SVHC_V.1~15 | 2-Ethoxyethanol             | 2-乙氧基乙醇             |
| 036 | REACH SVHC_V.1~15 | Trichloroethylene           | 三氯乙烯                |
| 035 | REACH SVHC_V.1~15 | Tetraboron disodium hepta   | 水合七氧四硼酸二鈉           |
| 034 | REACH SVHC_V.1~15 | Sodium chromate             | 鉻酸鈉                 |
| 033 | REACH SVHC_V.1~15 | Potassium dichromate        | 重鉻酸鉀                |
| 032 | REACH SVHC_V.1~15 | Potassium chromate          | 鉻酸鉀                 |
| 031 | REACH SVHC_V.1~15 | Disodium tetraborate, anhy  | 硼砂,四硼酸二鈉,無水         |
| 030 | REACH SVHC_V.1~15 | Boric acid                  | 硼酸                  |
| 029 | REACH SVHC_V.1~15 | Ammonium dichromate         | 重鉻酸銨                |
| 028 | REACH SVHC_V.1~15 | Acrylamide                  | 丙烯醯胺                |
| 027 | REACH SVHC_V.1~15 | Tris(2-chloroethyl) phosph  | 三2-(氯乙基)磷酸酯(T       |
| 026 | REACH SVHC_V.1~15 | Pitch, coal tar, high-temp. | 煤瀝青,高溫              |
| 025 | REACH SVHC_V.1~15 | Lead sulfochromate yellow   | 顏料黃 34              |
| 024 | REACH SVHC_V.1~15 | Lead chromate molybdate     | 顏料紅 104             |
| 023 | REACH SVHC_V.1~15 | Lead chromate               | 鉻酸鉛                 |
| 022 | REACH SVHC_V.1~15 | Diisobutyl phthalate (DIBP) | 鄰苯二甲酸二異丁酯(D         |

|     |                   |                               |                 |
|-----|-------------------|-------------------------------|-----------------|
| 021 | REACH SVHC_V.1~15 | Anthracene oil, anthracene    | 蔥油,含蔥量少         |
| 020 | REACH SVHC_V.1~15 | Anthracene oil, anthracene    | 蔥油,蔥糊,輕油        |
| 019 | REACH SVHC_V.1~15 | Anthracene oil, anthracene    | 蔥油,蔥糊,蔥餾分離液     |
| 018 | REACH SVHC_V.1~15 | Anthracene oil, anthracene    | 蔥油,蔥糊           |
| 017 | REACH SVHC_V.1~15 | Anthracene oil                | 蔥油              |
| 016 | REACH SVHC_V.1~15 | 2,4-Dinitrotoluene            | 2,4-二硝基甲苯       |
| 015 | REACH SVHC_V.1~15 | Triethyl arsenate             | 三乙基砷酸鹽          |
| 014 | REACH SVHC_V.1~15 | Sodium dichromate             | 重鉻酸鈉            |
| 013 | REACH SVHC_V.1~15 | Lead hydrogen arsenate        | 砷酸氫鉛            |
| 012 | REACH SVHC_V.1~15 | Hexabromocyclododecane        | 六溴環十二烷及其異構      |
| 011 | REACH SVHC_V.1~15 | Dibutyl phthalate (DBP)       | 鄰苯二甲酸二丁酯(DBP)   |
| 010 | REACH SVHC_V.1~15 | Diarsenic trioxide            | 三氧化二砷           |
| 009 | REACH SVHC_V.1~15 | Diarsenic pentaoxide          | 五氧化二砷           |
| 008 | REACH SVHC_V.1~15 | Cobalt dichloride             | 二氯化鈷            |
| 007 | REACH SVHC_V.1~15 | Bis(tributyltin) oxide (TBTO) | 氧化三丁錫(TBTO)     |
| 006 | REACH SVHC_V.1~15 | Bis (2-ethylhexyl)phthalate   | 鄰苯二甲酸二(2-乙基     |
| 005 | REACH SVHC_V.1~15 | Benzyl butyl phthalate (BBP)  | 鄰苯二甲酸丁酯苯甲酯      |
| 004 | REACH SVHC_V.1~15 | Anthracene                    | 蔥               |
| 003 | REACH SVHC_V.1~15 | Alkanes, C10-13, chloro (S)   | 短鏈氯化石蠟 C10-13   |
| 002 | REACH SVHC_V.1~15 | 5-tert-butyl-2,4,6-trinitro-  | 5-叔丁基-2,4,6-三硝基 |
| 001 | REACH SVHC_V.1~15 | 4,4'- Diaminodiphenylmethane  | 4,4'-二氨基二苯甲烷(N  |

| CAS No.     | EC No.    |
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| 80-07-9     |           |
| 75980-60-8  |           |
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| 79-94-7     | 201-236-9 |
| 37853-59-1  | 253-692-3 |
| 924-42-5    | 213-103-2 |
| 1067-53-4   | 213-934-0 |
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| 6786-83-0   | 229-851-8 |
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| 3687-31-8          | 222-979-5 |
| 11103-86-9         | 234-329-8 |
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| 302-01-2, 7803-57- | 206-114-9 |
| 111-15-9           | 203-839-2 |
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| 10141-05-6         | 233-402-1 |
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| 110-80-5           | 203-804-1 |
| 79-01-6            | 201-167-4 |
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| 7775-11-3          | 231-889-5 |
| 7778-50-9          | 231-906-6 |
| 7789-00-6          | 232-140-5 |
| 12179-04-3, 1303-9 | 215-540-4 |
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| 7789-09-5          | 232-143-1 |
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| 115-96-8           | 204-118-5 |
| 65996-93-2         | 266-028-2 |
| 1344-37-2          | 215-693-7 |
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| 84-69-5            | 201-553-2 |

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| 90640-80-5         | 292-602-7 |
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| 7784-40-9          | 232-064-2 |
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| 85535-84-8         | 287-476-5 |
| 81-15-2            | 201-329-4 |
| 101-77-9           | 202-974-4 |



## Warranty for non-use of Hazardous Substances

As a supplier of Universal Microelectronic Co., Ltd. its subsidiaries, affiliates we here by certify that all materials, parts or products supplied by \_\_\_\_\_ are same fabricated as the sample that pass the third party tested and comply with the maximum concentration value requirements specified in the document of Restriction of Hazardous Substances management procedure (DOC.NO. E00-ST-004. Detail please browse the website <http://www.umec.com.tw/> ), any change shall inform Universal Microelectronic Co., Ltd. before implementation. Which the UMEC Group reserves the right to modify these documents at any time. If we cannot meet the requirements in the modified documents, we will submit an alternative in writing to consult with UMEC Group within one month after the announcement of such modification. If we fail to submit any alternative in writing to consult with UMEC Group within one month, such requirements in the modified documents shall be deemed agreed by us.

We also certify aware of the procedure requirement, In case of breach of this Warranty and such breach results in damages to Universal Microelectronic Co., Ltd., its subsidiaries, affiliates, We shall indemnify and hold harmless from all of its damages and be responsible for payment of all relevant fees which including, but not limited to, litigious fees, attorney's fees, communications fees and settlement fees, and shall settle any related disputes.

If any controversy or dispute should arise out of the effectiveness, construction, interpretation or performance of this Warranty, both parties hereto shall use their best efforts to negotiate in good faith to resolve all such controversy or dispute in an amicable manner. Upon failure to reach a settlement by negotiation as set out above, both parties agree to submit to arbitration in Taichung, Taiwan, ROC in accordance with ROC laws.

Warrantor

Company name :

Company seal :

Representative :

Address :

Date :

E00-ST-004-A

Annex1 REV 2

U-041E-1-A