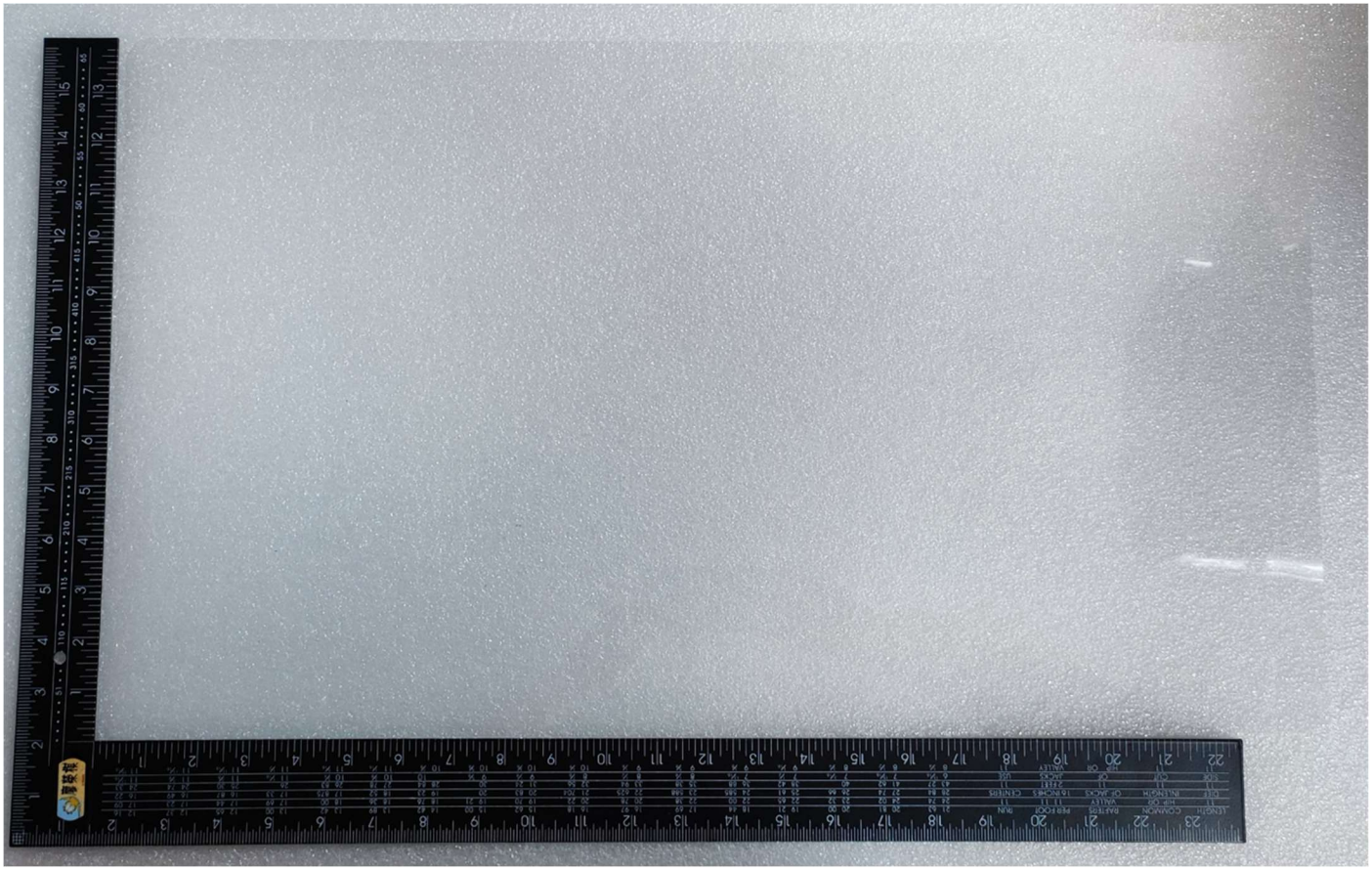


設計驗證
工程課
2025 -09- 23
發行

承　　認　　書

SPECIFICATION　FOR　APPROVAL

客戶:鈺緯科技開發股份有限公司

品名:麥拉 T60

規格:0.1T*615mm*358mm

料號:3MD695FM010(M3521)

主　管	審　查	製　作
游鈺衡	游鈺崧	王瀞融

設計驗證
工程課
2025 -09- 23
發行
鈺緯科技開發股份有限公司

俐　元　企　業　股　份　有　限　公　司

俐　誠　企　業　股　份　有　限　公　司

LI YUN　ENTERPRISE CO., LTD.

LI CHENG ENTERPRISE CO., LTD.

地　址：新　北　市　樹　林　區　三　龍　街　２０－１　號

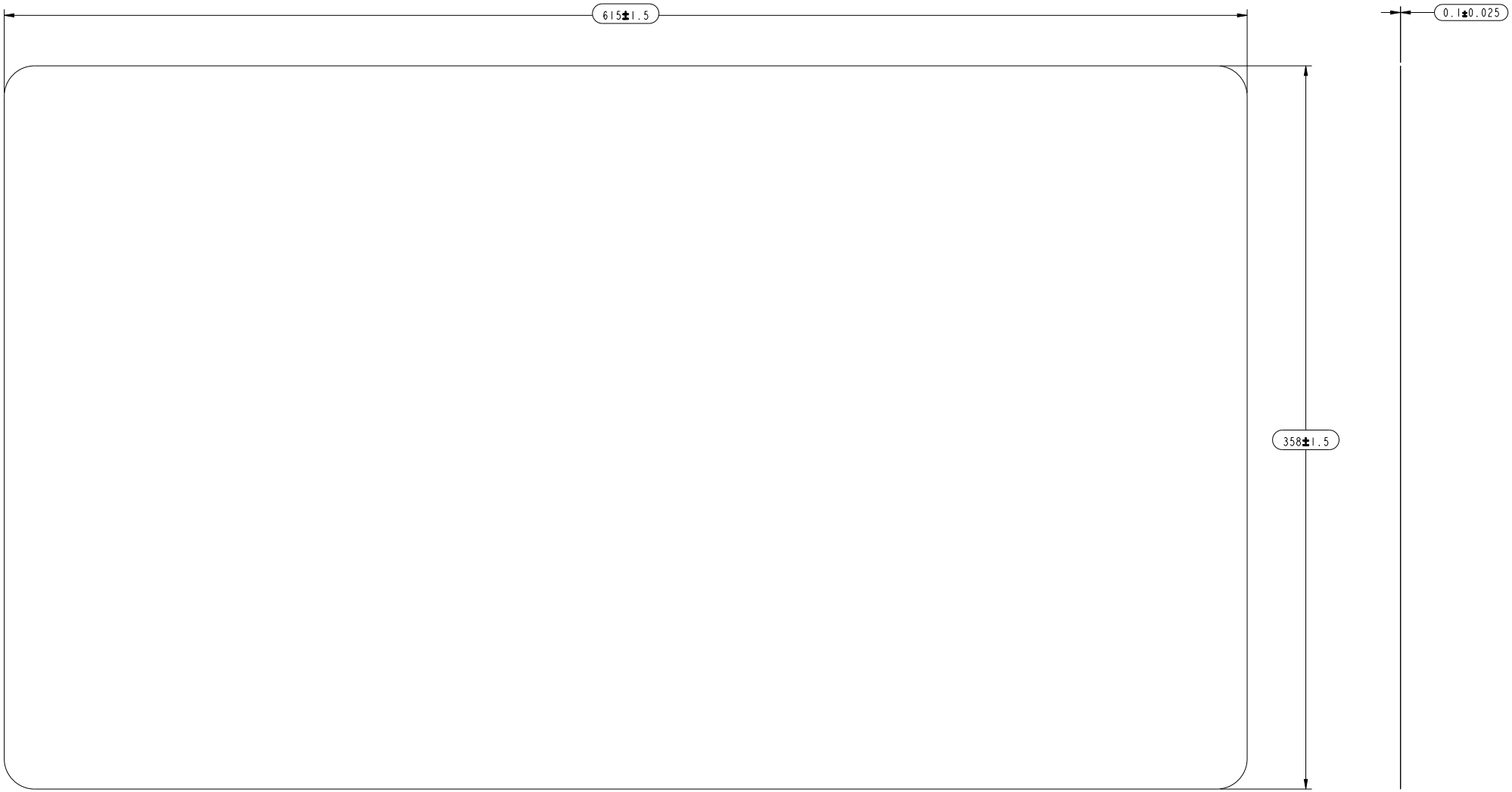
電話:(02)8688-8680　　傳真:(02)8688-8678

中　華　民　國 114 年 09 月 09 日

俐元企業股份有限公司

2025

REV	DATE	DESCRIPTION	DRAFT	APPROVED
0	2025-06-05	INITIAL RELEASE	Laslie	
A	2026-09-04	PRODUCTION RELEASE	Laslie	Ferris



NOTE:
1.Material: PET, Transparency, t=0.1.
2.Production by DIE-CUT Mold.
3.RoHS Compliant.

設計驗證
工程課
2025 -09- 23
發行
[illegible]科技開發股份有限公司

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MM. TOLERANCES: .X : ± 0.5 .XX : ± 0.30 .XXX : ± 0.250 ANGLE : ± 1.0° INTERPRET DIM AND TOL PER ASME Y14.5-2009
THIRD ANGLE PROJECTION

MATERIAL: PET	FINISH:	DIVA Laboratories. Ltd.	
DRAWN BY: Laslie 2025-06-05		PART NAME: PROTECTIVE FILM	
CHECKED BY: Ferris Tsai 2025-09-04		PART NUMBER: (M3521) 3MD695FM010	MFG. PART NUMBER: NA
APPROVED BY: Laslie 2025-09-04		MODEL NAME: VM15	SIZE: A1 / SCALE: 1:1 / SHEET: 1 OF 1 / REV: 0
FILE NAME: 827.240_PROTECTIVE_FILM	APPROVED NO.:		

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俐元企業股份有限公司
俐誠企業股份有限公司

成品出廠檢驗表

表單編號：FM-42A

客戶名稱	鈺緯科技開發股份有限公司	訂單號碼				交貨數量		
料號	3MD695FM010	品名規格	麥拉T60 0.1T*615mm*358mm			檢驗日期		
序號	規　格	檢　驗　值					檢驗結果	
	依客戶圖面檢驗	1	2	3	4	5	OK	NG
1	0.1 T ±0.025	0.12	0.11	0.12	0.11	0.12	✓	
2	615 ±1.50	615.30	615.33	615.30	615.33	615.31	✓	
3	358 ±1.50	358.29	358.30	358.29	358.28	358.30	✓	
4								
5								
6								
7								
8								
9								
10								

主管：　游鈺崧　　品管組長：劉美君　　品檢員：洪筱楓

"TORAY"

Lumirror®
Polyester Film

T60

Features :

T60 film is particularly excellent in its transparency.

Thickness :

25, 38, 50, 75, 100, 125, 188, 250μm

Typical properties :

Properties		Unit	#25 (92G)	#38 (150G)	#50 (200G)	#75 (300G)	#100 (400G)	#125 (500G)	#188 (750G)	#250 (10M)	Measurement method
Thickness	MMV	μm	25	38	50	75	100	125	188	250	
Tensile strength	MD	MPa	225	225	215	215	210	205	186	176	ASTM D882
	TD	MPa	245	245	225	225	220	215	196	168	ASTM D882
Elongation at Break	MD	%	170	140	150	150	150	150	190	190	ASTM D882
	TD	%	160	130	130	130	130	140	140	150	ASTM D882
Thermal Shrinkage at 150°C 30min	MD	%	1.3	1.3	1.2	1.2	1	0.9	0.9	0.9	ASTM D1204
	TD	%	0	0.4	0.3	0.3	0.2	0.3	0.5	0.6	ASTM D1204
Haze		%	0.6	0.6	0.9	0.9	1.3	1.6	2	3	ASTM D1003
Light Transmittance (550nm)		%	87	86.9	86.5	86.5	89	85.6	85.1	84	ASTM D1003

Applications :

T60 is suited for use in various applications where high transparency is required, including membrane switches, labels, overhead projector slides, and graphics applications.

Standards :

- UL746B : RTI Electrical 105 (°C) Mechanical 105 (°C)
- UL94VTM-2 (#38 ~ #188)

1. We accept no responsibility for results obtained by the application of the information indicated and for the safety and suitability of the products, by itself or in combination with other products. Users are advised to perform their own tests to determine the safety and suitability of such product and product combination according to each of its purposes.
2. Refer to our MSDS (Material Safety Data Sheet) before use.
3. The publication is not to be taken as a license to operate under, or as a recommendation to infringe any patents.

PENFIBRE SDN. BERHAD (13857-V)
(FILM DIVISION)
Lot 128-130, Prai Free Industrial Zone 1,
13600 Prai, Penang, Malaysia.
Tel: 604-3810000 Fax: 604-3810160

TORAY Lumirror®
Polyester Film

Safety Data Sheet

Created Date : 6th June 2014
Updated Date : 7th August 2023

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

1.1 Product Name : "Lumirror" T60

1.2 Other means of identification
Product No (SDS No) : F3E-AA0A0AFTPT60-4

1.3 Recommended use of the chemical and restrictions on use
(1) Recommended use : Industrial material
(2) Restrictions on use : Use only as an article

1.4 Supplier's details
(1) Company name : Penfibre Sdn. Berhad – Film Division
(2) Address : Lot 128 –130 Prai Free Industrial Zone 1, 13600 Prai, Penang, Malaysia
(3) Department : Sales and Marketing Department
(4) Person in charge : Sales and Marketing Department Manager
(5) Telephone number : 604-3810000
(6) Fax number : 604-3810160
(7) E-mail Address/URL : http://www.toraypenfibre.com.my

1.5 Emergency contact no. : 604-3810000

SECTION 2: HAZARDS IDENTIFICATION

2.1 GHS classification of the substance or mixture
This product is an Article. So it is outside the scope for classification under JIS Z 7252: 2019 (Labelling of chemicals based on GHS).

2.2 GHS label elements
Not applicable.

2.3 Other hazards which do not result in classification
No information available.

2.4 Major symptom and envisioned emergencies
No information available.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Product definition : Article

3.2 Composition/information on ingredients

Chemical identity of the substance : Polyethylene terephthalate

Content(%) : >99

Chemical property(chemical formula, structural formula) : -(OCH2CH2COO(C6H4)CO)n-

CAS No. : 25038-59-9

ENCS No.(Chemical Substances Control Law) : (7)-1022

ISHL No.(Industrial Safety and Health Act) : Existing chemical substances

TSCA : Registered

EC No. : Registered monomer

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

Inhalation:
If someone inhales the decomposed gas from high temperature film and feel sick, evacuate victim to an area with fresh air.
If you feel unwell, seek medical advice immediately.

Skin contact :
In case of skin contact with high temperature film, rinse immediately with large amounts of water.

Eye contact :
If you wear contact lenses, remove them immediately and rinse eyes with clean water.
Do not rub your eyes.
If you feel unwell, seek medical advice.

Ingestion:
In case of ingestion of resin, vomit it as soon as possible
If you feel abnormal or strange, seek medical advice.

4.2 Most important symptoms and effects, both acute and delayed
No information available.

4.3 Indication of any immediate medical attention and special treatment needed.
No information available.

SECTION 5: FIRE FIGHTING MEASURE

5.1 Extinguishing Media :

(1) Suitable extinguishing media

Water spray/Water jet/Foam/Powder/Carbon dioxide (CO2).

Use appropriate fire extinguisher depending on circumstances and surrounding environment.

(2) Unsuitable extinguishing media

No information.

5. 2 Special hazards arising from the product:

Toxic fumes or gas formed during combustion (Irritating and strong toxic gas).

Fire will produce dense black smoke

Incomplete combustion will generate dark smoke

5. 3 Specific fire-fighting measures

Protect surrounding equipment by spraying water from a safe distance.

Remove movable containers from the area of the fire if safe to do so.

Be sure to extinguish a fire from the windward side and keep a safe distance from a fire.

Unauthorized personnel shall be evacuated to a safe place

5.4 Special protective actions for fire-fighters

Fire-fighting personnel must wear protective equipment (Heat-resistant gloves/Fire-fighting clothing/Face shield/Self-contained breathing apparatus).

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear protective equipment such as gloves, goggles and mask depending on the situation.

6.2 Environmental precautions

Do not discard into sewage and drainage system.

6.3 Methods and materials for containment and cleaning up

Avoid dust scattering.

Carefully sweep up and remove.

6.4 Preventive measures against second disasters

Remove possible sources of ignition in the surrounding area.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

(1)Technical measures

A. Exposure control of handler

Do not inhale dust generated during film processing.
Do not inhale the decomposed gas generated from high temperature state

B. Prevention of fire/explosion

Take precautions against electrostatic discharge of the film charge.

(2) Local/general exhaust ventilation

If dust is generated during film processing, ventilation is required.
In case of drying, processing at high temperature, ventilation is required as decomposed gas is generated.
Installation of local exhaust ventilation is desirable.

(3) Precautions

If dust is generated during film processing, prevent accumulation of dust.
High concentration of dust may lead to dust explosion.

(4) Precautions for safe handling

Do not handle roughly or drop it.
Do not touch the high-temperature resin directly.
Injury may occur due to sharp-edged section of film.
Cracking and peeling off may occur during handling, injury might occur.

(5) Proper hygiene measures

No information available.

7.2 Conditions for safe storage, including any incompatibilities

(1) Technical measures

No information available

(2) Proper storage condition

Avoid direct sunlight.
Keep away from water and bases.

(3) Storage condition to avoid

Avoid prolonged storage.
Keep away from heat.
Keep away from sources of ignition.
Do not condense.

(4) Safe container materials

No specific container is designated.

SECTION 8 : EXPOSURE CONTROL / PERSONAL PROTECTION

8.1 Control parameters

No information.

8.2 Exposure controls

Use static eliminator to prevent electrostatic discharge.
In case of drying and processing at high temperature, local ventilation installation is required as decomposed gas is generated.

8.3 Individual protection measures

(1) Respiratory protection

For usual conditions, no respiratory protection is needed, however, in dusty atmospheres when films are processed, use an approved dust protective mask.
Use a dust protective mask.
Ask for a specialist's advice before using respiratory protection equipment.
In case of drying and processing at high temperature, use organic gas protective mask as decomposed gas is generated.

(2) Hand protection

For usual conditions, no protective gloves are needed, however, if there are sharp-edges, use protective gloves.
During handling at high temperature, wear heat-resistant gloves.

(3) Eye protection

For usual conditions, eye protector is not needed, however, in dusty atmospheres when films are processed or when there are sharp-edges, wear eye protective glasses or safety goggles.

(4) Skin and body protection

For usual conditions, no skin and body protector is needed, however, when there are sharp-edges or when handling films at high temperature, wear work clothes with long sleeves.

SECTION 9: PHYSICAL & CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical properties:

Appearance : solid
Color : Colorless
Odor : None

Phase change temperature:

Melting point:255-265°C
Flash point:300°C over
Spontaneous ignition temperature:450°C over
Specific gravity:1.35-1.45

9.2 Other information

No information available.

SECTION 10: STABILITY & REACTIVITY

10.1 Chemical stability
This product is considered stable under ordinary storage and handling condition.

10.2 Reactivity
It can be hydrolysed by a base.
Under normal conditions of storage and use, hazardous reactions will not occur

10.3 Conditions to avoid
No information available.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Toxicological information of the product
No known critical hazards.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Ecological information of the product
No information available

SECTION 13: DISPOSAL CONSIDERATION

13.1 Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

SECTION 14: TRANSPORT INFORMATION

14.1 International Guideline
Not applicable

14.2 Specific Safety Measures and Conditions on Transport
Avoid exposure to water and rough handling to prevent package from breaking.

SECTION 15: REGULATORY INFORMATION

15.1 Other Regulatory Information
We are not able to check up the Regulatory Information in your country or region in regards to substance of the material supplied. Therefore, we request this matter shall be the responsibility of the user.
Ensure that this material is compliance to the Law and Regulations of the country and Local Authorities.

SECTION 16: OTHER INFORMATION / REFERENCE

Date of issue/Date of revision

Date of revision : 7th August 2023

Revised item : We revised the contents of SDS according to the revision of JIS Z 7252:2019.

Reference

JIS Z 7253: 2019 Hazard communication of chemicals based on GHS-Labelling and Safety Data sheet (SDS)

JIS Z 7252: 2019 Classification of chemicals based on "Globally Harmonized System of Classification and Labelling of Chemicals (GHS)"

"NITE-CHRIP(NITE Chemical Risk Information Platform)". NITE(National Institute of Technology and Evaluation). https://www.nite.go.jp/chem/chrip/chrip_search/systemTop

"LOLI". ChemADVISOR Online. https://productintelligence.ul.com/Online/Login.aspx

Disclaimer

This SDS is made based on information and data currently available to us. It may be revised and updated when new information becomes available to us.

Although certain danger and hazard are described herein, we cannot guarantee that there is no other danger or hazard in or related to the materials. All materials may have unknown danger or hazard and should be used and handled in caution. Subject to user's ordinary use and handling, all remarks and precautions herein are described and it is user's responsibility to implement appropriate safety measures in case of their particular uses. Users should confirm and evaluate the safety of all materials, including its combination with other materials or parts and the suitability of the materials for their purposes on their own responsibilities.

No warranty, express or implied, is made with respect to the materials, including the completeness or accuracy of this information and we assume no liability for any damage resulting from user's use or handling of any materials.

This product consists of the raw materials which are registered chemicals in Japan (Chemical Substances Control Law, Industrial Safety and Health Law), United States of America (Toxic Substances Control Act), China (Inventory of Existing Chemical Substances), Europe (European Inventory of Existing Substances) and Korea (Korean Existing Chemicals List).

The registration status of the raw materials in the other countries and areas has not been confirmed.

測試報告
Test Report

號碼(No.): ETR25404054　　日期(Date): 25-Apr-2025　　

合富工業有限公司 (HOPE DISTRIBUTION INC.)
台北市基隆路一段111號10樓 (10F, NO. 111, SEC. 1, KEELUNG RD., TAIPEI, TAIWAN)

以下測試樣品係由申請廠商所提供及確認 (The following sample(s) was/were submitted and identified by the applicant as)：

送樣廠商(Sample Submitted By)	:	合富工業有限公司 (HOPE DISTRIBUTION INC.)
樣品名稱(Sample Name)	:	POLYESTER FILM
樣品型號(Style/Item No.)	:	T60 (F60, F65, F65K,F68M,F53,F53K)
供應/製造廠商(Supplier)	:	TORAY INDSTRIES INC.
原產國(Country of Origin)	:	日本 (JAPAN)

==========

收件日(Sample Receiving Date)	:	17-Apr-2025
測試期間(Testing Period)	:	17-Apr-2025 to 25-Apr-2025

測試需求(Test Requested) :

(1) 依據客戶指定，參考RoHS 2011/65/EU Annex II及其修訂指令(EU) 2015/863測試鎘、鉛、汞、六價鉻、多溴聯苯、多溴聯苯醚, DBP, BBP, DEHP, DIBP。 (As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).)

(2) 其他測試項目請見下一頁。 (Please refer to next pages for the other item(s).)

測試結果(Test Results) : 請參閱下一頁 (Please refer to following pages.)

Troy Chang / Department Manager
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei

PIN CODE: 433658F7

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測試報告
Test Report

號碼(No.): ETR25404054　　日期(Date): 25-Apr-2025　　

合富工業有限公司 (HOPE DISTRIBUTION INC.)
台北市基隆路一段111號10樓 (10F, NO. 111, SEC. 1, KEELUNG RD., TAIPEI, TAIWAN)

測試部位敘述 (Test Part Description)

No.1　：　透明塑膠片 (TRANSPARENT PLASTIC SHEET)

測試結果 (Test Results)

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)
				No.1
鎘 (Cd) (Cadmium (Cd))	參考IEC 62321-5: 2013，以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	n.d.
鉛 (Pb) (Lead (Pb))	參考IEC 62321-5: 2013，以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	n.d.
汞 (Hg) (Mercury (Hg))	參考IEC 62321-4: 2013+ AMD1: 2017，以感應耦合電漿發射光譜儀分析。(With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.)	mg/kg	2	n.d.
六價鉻 Cr(VI) (Hexavalent Chromium Cr(VI))	參考IEC 62321-7-2: 2017，以紫外光-可見光分光光度計分析。(With reference to IEC 62321-7-2: 2017, analysis was performed by UV-VIS.)	mg/kg	8	n.d.
一溴聯苯 (Monobromobiphenyl)	參考IEC 62321-6: 2015，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.)	mg/kg	5	n.d.
二溴聯苯 (Dibromobiphenyl)		mg/kg	5	n.d.
三溴聯苯 (Tribromobiphenyl)		mg/kg	5	n.d.
四溴聯苯 (Tetrabromobiphenyl)		mg/kg	5	n.d.
五溴聯苯 (Pentabromobiphenyl)		mg/kg	5	n.d.
六溴聯苯 (Hexabromobiphenyl)		mg/kg	5	n.d.
七溴聯苯 (Heptabromobiphenyl)		mg/kg	5	n.d.
八溴聯苯 (Octabromobiphenyl)		mg/kg	5	n.d.
九溴聯苯 (Nonabromobiphenyl)		mg/kg	5	n.d.
十溴聯苯 (Decabromobiphenyl)		mg/kg	5	n.d.
多溴聯苯總和 (Sum of PBBs)		mg/kg	-	n.d.

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測試報告
Test Report

合富工業有限公司 (HOPE DISTRIBUTION INC.)
台北市基隆路一段111號10樓 (10F, NO. 111, SEC. 1, KEELUNG RD., TAIPEI, TAIWAN)

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)
				No.1
一溴聯苯醚 (Monobromodiphenyl ether)	參考IEC 62321-6: 2015，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.)	mg/kg	5	n.d.
二溴聯苯醚 (Dibromodiphenyl ether)		mg/kg	5	n.d.
三溴聯苯醚 (Tribromodiphenyl ether)		mg/kg	5	n.d.
四溴聯苯醚 (Tetrabromodiphenyl ether)		mg/kg	5	n.d.
五溴聯苯醚 (Pentabromodiphenyl ether)		mg/kg	5	n.d.
六溴聯苯醚 (Hexabromodiphenyl ether)		mg/kg	5	n.d.
七溴聯苯醚 (Heptabromodiphenyl ether)		mg/kg	5	n.d.
八溴聯苯醚 (Octabromodiphenyl ether)		mg/kg	5	n.d.
九溴聯苯醚 (Nonabromodiphenyl ether)		mg/kg	5	n.d.
十溴聯苯醚 (Decabromodiphenyl ether)		mg/kg	5	n.d.
多溴聯苯醚總和 (Sum of PBDEs)		mg/kg	-	n.d.
鄰苯二甲酸丁苯甲酯 (BBP) (Butyl benzyl phthalate (BBP))	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.
鄰苯二甲酸二丁酯 (DBP) (Dibutyl phthalate (DBP))	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.
鄰苯二甲酸二(2-乙基己基)酯 (DEHP) (Di-(2-ethylhexyl) phthalate (DEHP))	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.
鄰苯二甲酸二異丁酯 (DIBP) (Diisobutyl phthalate (DIBP))	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.
鄰苯二甲酸二異癸酯 (DIDP) (Diisodecyl phthalate (DIDP)) (CAS No.: 26761-40-0, 68515-49-1)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.
鄰苯二甲酸二異壬酯 (DINP) (Diisononyl phthalate (DINP)) (CAS No.: 28553-12-0, 68515-48-0)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.
鄰苯二甲酸二正辛酯 (DNOP) (Di-n-octyl phthalate (DNOP)) (CAS No.: 117-84-0)	參考IEC 62321-8: 2017，以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.

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測試報告
Test Report

合富工業有限公司 (HOPE DISTRIBUTION INC.)
台北市基隆路一段111號10樓 (10F, NO. 111, SEC. 1, KEELUNG RD., TAIPEI, TAIWAN)

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)
				No.1
六溴環十二烷及所有主要被辨別出的異構物(HBCDD) (α- HBCDD, β- HBCDD, γ- HBCDD) (Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α- HBCDD, β- HBCDD, γ- HBCDD)) (CAS No.: 25637-99-4, 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	參考IEC 62321: 2008，以氣相層析儀/質譜儀分析。(With reference to IEC 62321: 2008, analysis was performed by GC/MS.)	mg/kg	5	n.d.
氟 (F) (Fluorine (F)) (CAS No.: 14762-94-8)	參考BS EN 14582: 2016，以離子層析儀分析。(With reference to BS EN 14582: 2016, analysis was performed by IC.)	mg/kg	50	n.d.
氯 (Cl) (Chlorine (Cl)) (CAS No.: 22537-15-1)		mg/kg	50	n.d.
溴 (Br) (Bromine (Br)) (CAS No.: 10097-32-2)		mg/kg	50	n.d.
碘 (I) (Iodine (I)) (CAS No.: 14362-44-8)		mg/kg	50	n.d.
全氟辛烷磺酸及其鹽類 (PFOS and its salts) (Perfluorooctane sulfonates and its salts (PFOS and its salts)) (CAS No.: 1763-23-1 and its salts)	參考CEN/TS 15968: 2010，以液相層析串聯質譜儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	mg/kg	0.01	n.d.
全氟辛酸及其鹽類 (PFOA and its salts) (Perfluorooctanoic acid and its salts (PFOA and its salts)) (CAS No.: 335-67-1 and its salts)	參考CEN/TS 15968: 2010，以液相層析串聯質譜儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	mg/kg	0.01	n.d.
聚氯乙烯 (Polyvinyl chloride) (PVC)	參考ASTM E1252: 2021，以傅立葉轉換紅外線光譜儀及焰色法分析。(With reference to ASTM E1252: 2021, analysis was performed by FT-IR and Flame Test.)	**	-	Negative
甲醛 (Formaldehyde) (CAS No.: 50-00-0)	參考ISO 17226-1: 2021，以液相層析儀/二極體陣列偵測器分析。(With reference to ISO 17226-1: 2021, analysis was performed by LC/DAD.)	mg/kg	3	n.d.

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測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)
				No.1
銻 (Sb) (Antimony (Sb)) (CAS No.: 7440-36-0)	參考US EPA 3052: 1996，以感應耦合電漿發射光譜儀分析。(With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.)	mg/kg	2	133

備註(Note)：

1. mg/kg = ppm；0.1wt% = 0.1% = 1000ppm
2. MDL = Method Detection Limit (方法偵測極限值)
3. n.d. = Not Detected (未檢出)；小於MDL / Less than MDL
4. "-" = Not Regulated (無規格值)
5. **= Qualitative analysis (No Unit) 定性分析(無單位)
6. Negative = Undetectable 陰性(未偵測到/未檢出); Positive = Detectable 陽性(已偵測到/檢出)

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台北市基隆路一段111號10樓 (10F, NO. 111, SEC. 1, KEELUNG RD., TAIPEI, TAIWAN)

PFAS Remark：

現有PFAS定量技術是分析PFAS物質的特定結構，但同碳數族群之PFAS酸及鹽類物質，其可被辨識的特定結構相同，因此無法區別所分析的特定結構是來自酸或者鹽類，故測試結果為同碳數族群之PFAS之酸及鹽類物質的濃度總合。下表PFAS物質濃度皆已包含在測試結果中，相關資訊請參見下表：(下表列舉PFAS物質僅為範例，並不包含所有同碳數族群之PFAS鹽類。)
(The quantitative technology of PFAS is to analyze the specific structure of PFAS substances. However, PFAS acid and its salts with the same carbon number group have the same specific structure that can be identified. The tested results of the analyzed specific structure cannot be distinguished to identify the contribution from PFAS acid or its salts. Therefore, the tested results display the sum of concentrations of PFAS acids and its salts with the same carbon number group. The concentration of PFAS substances in the below table have been included in the tested results, please refer to the table for relevant information: (The listed PFAS substances are examples only, it do not include all PFAS salts with the same carbon number group.))

群組名稱 (Group Name)	物質名稱 (Substance Name)	CAS No.
PFOS, 及其鹽&衍生物 (PFOS, its salts & derivatives)	全氟辛烷磺酸 (Perfluorooctane sulfonates) (PFOS)	1763-23-1
	全氟辛基磺酸鉀 (PFOS-K) Potassium perfluorooctanesulfonate (PFOS-K)	2795-39-3
	全氟辛基磺酸鋰 (PFOS-Li) Perfluorooctanesulfonic acid, lithium salt (PFOS-Li)	29457-72-5
	全氟辛基磺酸銨 (PFOS-NH_4) Perfluorooctanesulfonic acid, ammonium salt (PFOS-NH_4)	29081-56-9
	全氟辛基磺酸二乙醇銨 (PFOS-NH(C2H4OH)2) Perfluorooctane sulfonate diethanolamine salt (PFOS-NH(C2H4OH)2)	70225-14-8
	全氟辛基磺酸四乙基銨 (PFOS-$N(C_2H_5)_4$) Perfluorooctanesulfonic acid,tetraethylammonium salt (PFOS-$N(C_2H_5)_4$)	56773-42-3
	全氟辛基磺酸二癸二甲基銨 (PFOS-DDA) N-decyl-N,N-dimethyldecan-1-aminium 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctane-1-sulfonate (PFOS-DDA)	251099-16-8
	全氟辛基磺酸四丁基銨 (PFOS-$N(C_4H_9)_4$) TetrabutylAmmonium perfluorooctanesulfonate (PFOS-$N(C_4H_9)_4$)	111873-33-7
	全氟辛基磺醯氟 (POSF) Perfluorooctane sulfonyl fluoride (POSF)	307-35-7
	全氟辛基磺酸鎂 (PFOS-Mg) Perfluorooctanesulfonic acid, magnesium salt (PFOS-Mg)	91036-71-4
	全氟辛基磺酸鈉 (PFOS-Na) Perfluorooctanesulfonic acid, sodium salt (PFOS-Na)	4021-47-0

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台北市基隆路一段111號10樓 (10F, NO. 111, SEC. 1, KEELUNG RD., TAIPEI, TAIWAN)

群組名稱 (Group Name)	物質名稱 (Substance Name)	CAS No.
PFOS, 及其鹽&衍生物 (PFOS, its salts & derivatives)	全氟辛烷磺酸哌啶 Piperidine 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctanesulfonate	71463-74-6
	全氟辛烷磺酸鹽 Perfluorooctanesulfonate (anion)	45298-90-6
	全氟辛烷磺酸與 N,N-二乙基乙胺 (1:1) (PFOS-N(C_2H_5)$_3$) 1-Octanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-, compd. with N,N-diethylethanamine (1:1) (PFOS-N(C_2H_5)$_3$)	54439-46-2
	N,N,N-三甲基-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十七氟-1-辛烷磺酸甲銨(1:1) (PFOS-N(CH_3)$_4$) Methanaminium, N,N,N-trimethyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1) (PFOS-N(CH_3)$_4$)	56773-44-5
	1-五胺，N,N,N-三丙基-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十七氟-1 -辛烷磺酸鹽(1:1) (PFOS-N(C_3H_7)$_3$(C_5H_{11})) 1-Pentanaminium, N,N,N-tripropyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1) (PFOS-N(C_3H_7)$_3$(C_5H_{11}))	56773-56-9
	1-丁銨，N,N-二丁基-N-甲基-，1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8 ,8-十七氟-1-辛烷磺酸鹽 (1:1) (PFOS-N(C_4H_9)$_3$(CH_3)) 1-Butanaminium, N,N-dibutyl-N-methyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1) (PFOS-N(C_4H_9)$_3$(CH_3))	124472-68-0
	碘鎓，雙[4-(1,1-二甲基乙基)苯基]-，1,1,2,2,3,3,4,4,5,5,6,6,7,7 ,8,8,8 -十七氟-1-辛烷磺酸鹽 (1:1) Iodonium, bis[4-(1,1-dimethylethyl)phenyl]-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1)	213740-80-8
	二苯基鋶(2,4,6-三甲基苯基)-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8 ,8-十七氟-1-辛烷磺酸鹽 (1:1) Sulfonium, diphenyl(2,4,6-trimethylphenyl)-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1)	258341-99-0
	吡啶鎓，1-十六烷基-，1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十七氟-1 -辛烷磺酸鹽 (1:1) Pyridinium, 1-hexadecyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1)	334529-63-4

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台北市基隆路一段111號10樓 (10F, NO. 111, SEC. 1, KEELUNG RD., TAIPEI, TAIWAN)

群組名稱 (Group Name)	物質名稱 (Substance Name)	CAS No.
PFOS, 及其鹽&衍生物 (PFOS, its salts & derivatives)	1-癸胺，N,N,N-三乙基-，1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十七氟-1 -辛烷磺酸鹽(1:1) 1-Decanaminium, N,N,N-triethyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1)	773895-92-4
	全氟辛烷磺酸四丁基鏻 (PFOS-P(C_4H_9)$_4$)) Tetrabutylphosphonium perfluorooctane sulfonate (PFOS-P(C_4H_9)$_4$))	2185049-59-4
	全氟辛烷磺酸二乙胺鹽 (PFOS-$C_4H_{11}N$) Perfluorooctanesulfonic acid diethylamine salt (PFOS-$C_4H_{11}N$)	2205029-08-7
	庚基二甲基{2-[(2-甲基丙-2-烯酰基)氧基]乙基}全氟辛烷磺酸氮紮鹽 (PFOS-$C_{15}H_{30}NO_2$) Heptyldimethyl{2-[(2-methylprop-2-enoyl)oxy]ethyl}azanium perfluorooctanesulfonate (PFOS-$C_{15}H_{30}NO_2$)	1203998-97-3
	1-辛烷磺酸，1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十七氟-,1,1' -酸酐 (PFOSAN) 1-Octanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-, 1,1'-anhydride (PFOSAN)	423-92-7
PFOA, 及其鹽&衍生物 (PFOA, its salts & derivatives)	全氟辛酸 (Perfluorooctanoic acid) (PFOA)	335-67-1
	全氟辛酸鈉 (PFOA-Na) Sodium perfluorooctanoate (PFOA-Na)	335-95-5
	全氟辛酸鉀 (PFOA-K) Potassium perfluorooctanoate (PFOA-K)	2395-00-8
	全氟辛酸銀 (PFOA-Ag) Silver perfluorooctanote (PFOA-Ag)	335-93-3
	全氟辛氟 (PFOA-F) Perfluorooctanoyl fluoride (PFOA-F)	335-66-0
	全氟辛酸銨 (APFO) Ammonium pentadecafluorooctanoate (APFO)	3825-26-1
	全氟辛酸鋰 (PFOA-Li) Lithium perfluorooctanoate (PFOA-Li)	17125-58-5
	全氟辛酸鈷 (PFOA-Co) Cobalt perfluorooctanoate (PFOA-Co)	35965-01-6

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群組名稱 (Group Name)	物質名稱 (Substance Name)	CAS No.
PFOA, 及其鹽&衍生物 (PFOA, its salts & derivatives)	全氟辛酸銫 (PFOA-Cs) Cesium perfluorooctanoate (PFOA-Cs)	17125-60-9
	全氟辛酸鉻 (PFOA-Cr(3^+)) Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-, chromium(3+) (PFOA-Cr(3^+))	68141-02-6
	全氟辛酸-哌嗪(2:1) PFOA-NH($C_4H_{10}N$) Pentadecafluorooctanoic acid--piperazine (2/1) PFOA-NH($C_4H_{10}N$)	423-52-9
	全氟辛酸鹽 Pentadecafluorooctanoate (anion)	45285-51-6
	全氟辛酸酐 Perfluorooctanoic Anhydride	33496-48-9
	乙銨，N,N,N-三乙基-, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十五氟辛酸 (1:1) Ethanaminium, N,N,N-triethyl-, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluorooctanoate (1:1)	98241-25-9
	全氟辛酸四甲銨鹽 Tetramethylammoniumperfluoroctanoat	32609-65-7
	1-丙銨，N,N,N-三丙基-, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十五氟辛酸(1:1) 1-Propanaminium, N,N,N-tripropyl-, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluorooctanoate (1:1)	277749-00-5
	辛酸，2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十五氟-鉀鹽，水合物 (1:1:2) (PFOA-K(H_2O)$_2$) Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-, potassium salt, hydrate (1:1:2) (PFOA-K(H_2O)$_2$)	98065-31-7
	辛酸，2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十五氟-，化合物。與乙胺 (1:1) (PFOA-C_2H_7N) Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-, compd. with ethanamine (1:1) (PFOA-C_2H_7N)	1376936-03-6
	十五氟辛酸化合物與吡啶 (1:1) (9CI) (PFOA-C_5H_5N) Octanoic acid, pentadecafluoro-, compd. with pyridine (1:1) (9CI) (PFOA-C_5H_5N)	95658-47-2

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Test Report

合富工業有限公司 (HOPE DISTRIBUTION INC.)
台北市基隆路一段111號10樓 (10F, NO. 111, SEC. 1, KEELUNG RD., TAIPEI, TAIWAN)

群組名稱 (Group Name)	物質名稱 (Substance Name)	CAS No.
PFOA, 及其鹽&衍生物 (PFOA, its salts & derivatives)	十五氟辛酸-1-苯基哌嗪(1:1) (PFOA-$C_{10}H_{14}N_2$) Pentadecafluorooctanoic acid- 1-phenylpiperazine(1:1) (PFOA-$C_{10}H_{14}N_2$)	1514-68-7
	1-辛胺，N,N,N-三甲基-，2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十五氟辛酸(1:1) (PFOA- $C_{11}H_{26}N$) 1-Octanaminium, N,N,N-trimethyl-, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluorooctanoate (1:1) (PFOA- $C_{11}H_{26}N$)	927835-01-6

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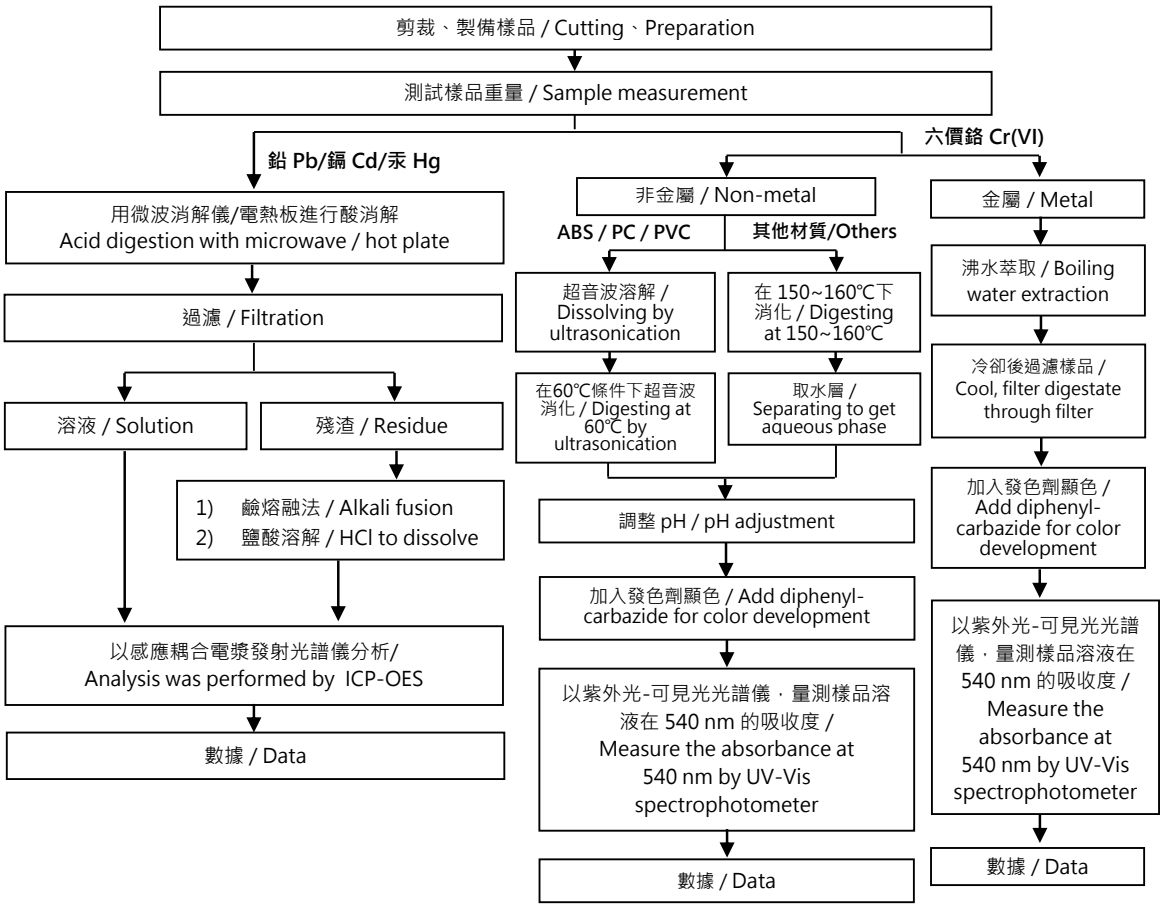
重金屬流程圖 / Analytical flow chart of heavy metal

根據以下的流程圖之條件，樣品已完全溶解。（六價鉻測試方法除外）

These samples were dissolved totally by pre-conditioning method according to below flow chart.

（Cr^{6+} test method excluded）



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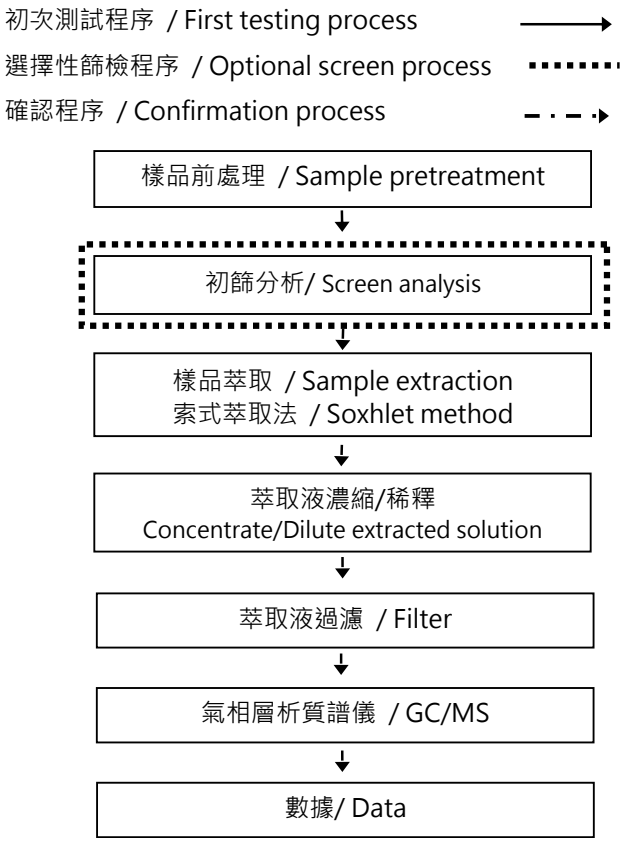
多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBBs/PBDEs



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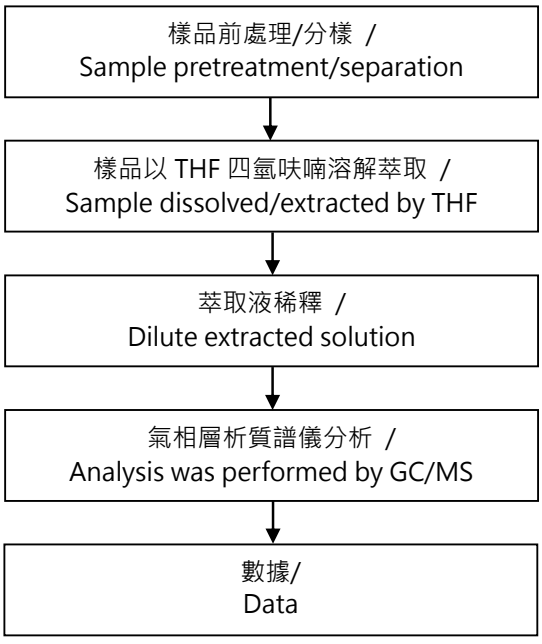
可塑劑分析流程圖 / Analytical flow chart - Phthalate

【測試方法/Test method: IEC 62321-8】



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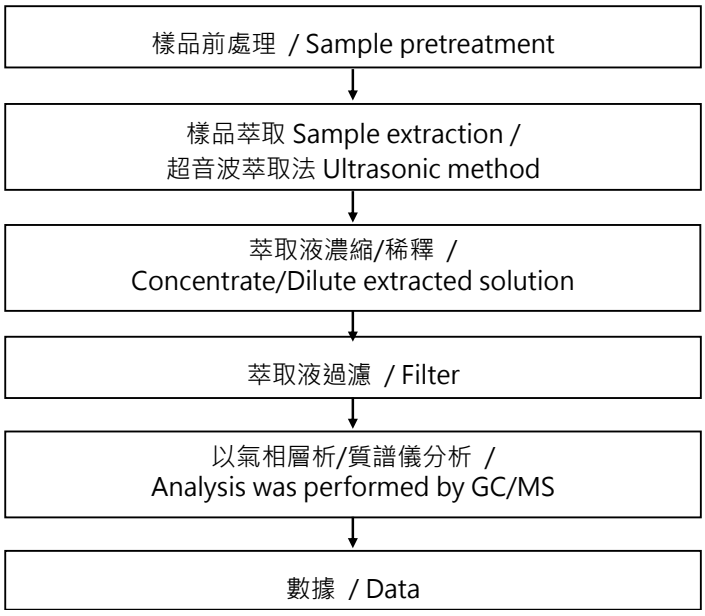
六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD



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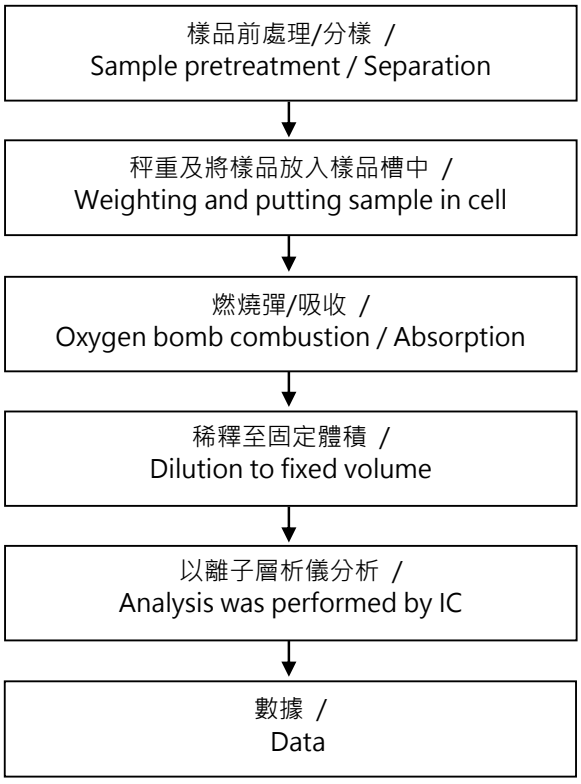
鹵素分析流程圖 / Analytical flow chart - Halogen



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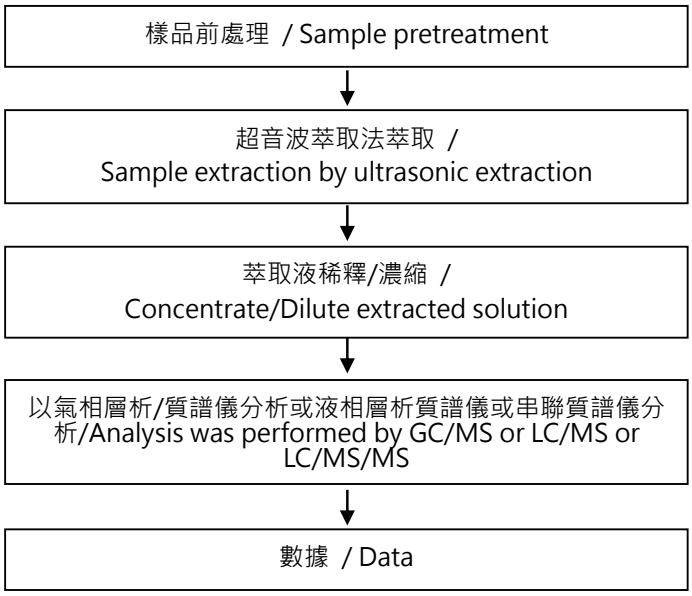
全氟化合物(包含全氟辛酸/全氟辛烷磺酸/其相關化合物等等)分析流程圖 / Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)



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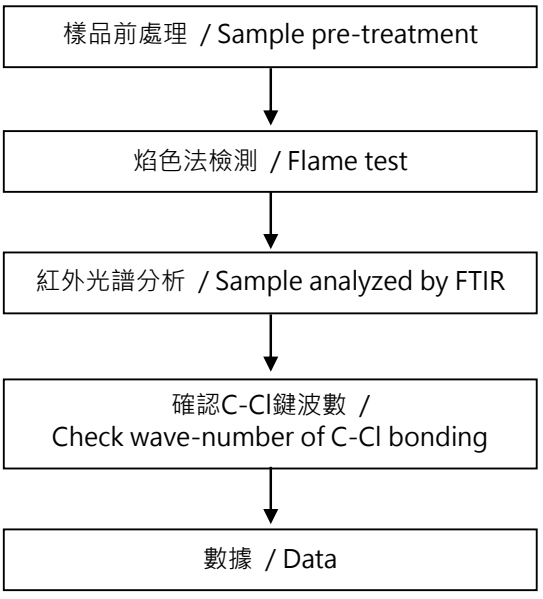
聚氯乙烯物質判定分析流程圖 / Analysis flow chart - PVC



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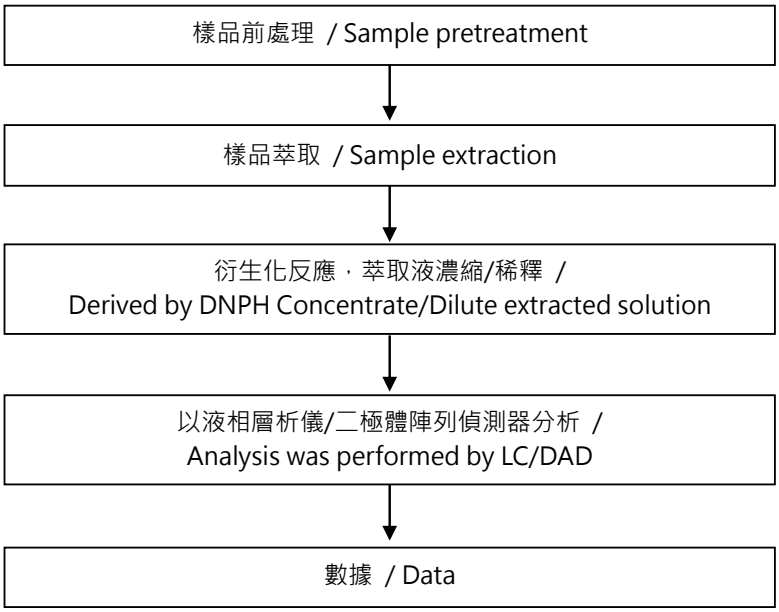
甲醛分析流程圖 / Analytical flow chart - Formaldehyde



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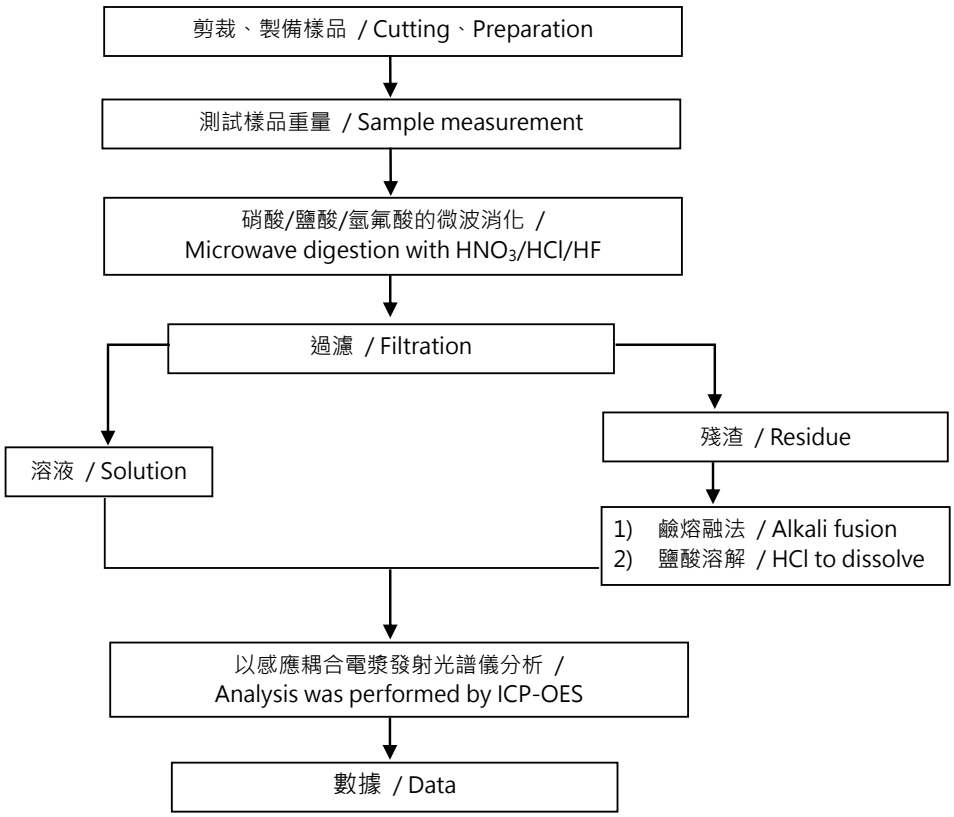
元素(含重金屬)分析流程圖 / Analytical flow chart of elements (Heavy metal included)

根據以下的流程圖之條件，樣品已完全溶解。

These samples were dissolved totally by pre-conditioning method according to below flow chart.

【參考方法/Reference method：US EPA 3051A、US EPA 3052】



* US EPA 3051A 方法未添加氫氟酸 / US EPA 3051A method does not add HF.

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測試報告
Test Report

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*** 照片中如有箭頭標示，則表示為實際檢測之樣品/部位. ***
(The tested sample / part is marked by an arrow if it's shown on the photo.)

ETR25404054



** 報告結尾 (End of Report) **

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'TORAY'
Innovation by Chemistry

Date : 28th May 2025

To : Whom It May Concern

Dear Sir,

Re: REACH SVHC Declaration

This declaration refers to the product: Lumirror PET Film

Our company hereby declared that, in the manufacturing of the above-mentioned product, "Lumirror PET Film" delivered to your company does not uses or intentionally incorporate with substances as stated below which identified as potential SVHC candidates list 250 by the European Chemicals Agency (ECHA) published the 33rd updated of the REACH candidate list for eventual inclusion entry referred on 14 April 2025.

No.	Substance Name	EC Number	CAS Number
1.	1,1,1,3,5,5,5-heptamethyl-3-[(trimethylsilyl)oxy]trisiloxane	241-867-7	17928-28-8
2.	Decamethyltetrasiloxane	205-491-7	141-62-8
3.	Tetra(sodium/potassium) 7-[(E)-{2-acetamido-4-[(E)-(4-{[4-chloro-6-({2-[(4-fluoro-6-{[4-(vinylsulfonyl)phenyl]amino}-1,3,5-triazine-2-yl)amino]propyl}amino)-1,3,5-triazine-2-yl]amino}-5-sulfonato-1-naphthyl)diazenyl]-5-methoxyphenyl}diazenyl]-1,3,6-naphthalenetrisulfonate; Reactive Brown 51	-	466-490-7

Note:

1. Please note that we do not do specific analyses to detect the presence of the above-mentioned substances.
2. The present certificate only concerns the composition of the above-mentioned product and does not guarantee compliance with the final article made of that product. It is the user's responsibility to satisfy himself as to the suitability and completeness of such information for own particular use.

Thank you.
Yours sincerely,

28/May/2025

Jun Kobayashi
General Director, Dy. General Manager

PENFIBRE SDN BERHAD [197301000291 (13857-V)]
(FILM DIVISION)
Lot 128 - 130, Prai Free Industrial Zone 1, 13600 Prai, Penang MALAYSIA
☎ + 60 – 4 - 3810 000 🖷 +60 – 4 - 3810 161