金射仕國際有限公司

承認書

型號：BP-CR2032-M90-001
料號：175011301K

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製作日期：2019-9-2

1.
不使用物質聲明書

不使用限用物質聲明書
Non-use of restricted substances statement

AAEON an ASUS assoc. co.

QD4-089 Rev.B2

請填寫相關資訊

Please fill in the relevant information：

公司名稱 Company name：金射仕國際有限公司

公司負責人 Company Responsible Person：王騏臻

立書人 Declarant：王騏臻

立書人職稱 Declarant's Title：董事長

本聲明書生效日期 Effective Date of this Declaration：AUG 13 2019

(公司章 Company Stamp)

請勾選本聲明書適用範圍

Please Select the Scope of this Declaration：

☑提供給研揚的全部產品 All Products provided to AAEON

☐研揚料號 AAEON Part Number：

☐原廠料號 Manufacturer Part Number：

(負責人章 Responsible Person Chop)

金射仕國際有限公司 (填寫公司名稱) 響應全球綠色環保法規或其他法律，保證如下事項：

BATTERY POWER COMPANY **(Fill in Company name) Response to global green environmental protection regulations or other laws, guarantee the following matters:**

一、產品符合歐盟 RoHS (2011/65/EU)* 規範。
The product complies with EU RoHS (2011/65/EU) norms.

i. 歐盟於 2015 年 6 月 4 日公布指令 (EU) 2015/863，將四項可塑劑 DEHP, BBP, DBP and DIBP 增加至 Annex II 清單中，限值仍為 1000ppm，從 2019 年 7 月 22 日起需符合此要求，作為供應商，如果有包含上述物質，務必主動通知研揚。
EU announce with (EU)2015/863 that DEHP, BBP, DBP and DIBP are primarily used to soften plastics, that will be restricted from **22 July 2019** for all electrical and electronic equipment. As suppliers, if your components content with above substances, please inform to AAEON related people.

管制文件,不可任意複製/更改
Regulatory documents that can not be arbitrarily Copy / Change

Focus • Agility • Competitiveness

5F, No. 135, Lane 235, PaoChiao Rd., Hsin-Tien Dist, New Taipei City, 231, Taiwan, R.O.C.

ii. 當作為包材類的材料，也須符合歐盟包裝指令(94/62/EC) 與修訂指令(2013/2/EU)
When used as package material, it also needs to comply with EU package directive (94/62/EC) and amendment (2013/2/EU)
Note: Pb+Cd+Hg+Cr^{6+} <100 ppm

iii. 若為電池零件，也須符合電池指令 2006/66/EC 與修訂指令 2013/56/EU
For battery components, it also needs to comply with EU battery directive (2006/66/EC) and amendment (2013/56/EU)
Note: Cd<20ppm; Hg <5ppm

二、產品符合衝突金屬(Conflict Metal)規範，並確認銷售產品若有含錫、鉭、鎢、金這四種礦產，來源並非來自剛果民主共和國及其周邊國家剛果、烏干達、蘇 丹、坦桑尼亞、盧旺達、安哥拉、贊比亞、布隆迪。
The product complies with the conflict metal norms, and confirm that your company selling products contain tin、tantalum、tungsten、gold four mineral, those sources are not come from Democratic Republic of the Congo and its neighboring countries of Congo、Uganda、San、Tanzania、Rwanda、Angola, Zambia, Burundi.

三、產品符合歐盟最新REACH (EC 1907/2006) 規範，
高關注物質(SVHC)，不超過 0.1%上限，以重量計算。
備註：請參照歐盟化學總署(ECHA)網站，最新的高關注物質清單。
This product complies with latest EU REACH (EC 1907/2006) norms.
The SVHC, are not over 0.1% threshold by weight.
Note: Please check ECHA website for latest SVHC list: https://echa.europa.eu/candidate-list-table

立書人提供給研揚的所有文件（含測試報告、聲明書、調查表等文件)，均正確屬實並且完整。
All documents (including test reports, declarations, survey forms, etc.) provided by Declarant to AAEON shall be correct, true and complete.

如有違背此保證聲明書的規定，金射仕國際有限公司(填寫公司名稱)將承擔相關法律責任並賠償研揚所受損害。
If violates any provision of this Declaration, BATTERY POWER COMPANY (Fill in Company name) shall take legal responsibilities and compensate AAEON for damages and losses caused by this violation.

管制文件,不可任意複製/更改
Regulatory documents that can not be arbitrarily Copy / Change

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2.

材料清單表

BOM-產品組合明細表

產品名稱：BP-CR2032-M90-001

日期: 2019/9/2

料號:175011301K

項次	料號	主/副料名稱	規　格	用量	單位	備註
1		3V 鋰電池	maxell CR2032 H	1	PC	
2	BP134	0.1mm不鏽鋼端子焊片	0.1x2.5x11.5mm	2	片	
3	BPC019	UL1571#28	80度C 30V PVC電子線 RED	1	條	
4	BPC019	UL1571#28	80度C 30V PVC電子線 BLACK	1	條	
5	BP136	Connectoy Housing	Molex 51021-0200	1	PC	
6	BP137	Terminal	Molex 50058-8000	1	PC	
7	BP138	黑熱縮套管	HAMBURG H-2/H2(CB)1.5x6mm	2	PCS	
8	BP139-1	黑熱收縮膜PET	電池外套 29x32mm	1	PC	
9	BP139-1	黑熱收縮膜PET	電池內圈38x11 mm	1	PC	
10	BP-150	3M 雙面貼紙	3M 9888T 10x10mm	1	PC	
11	BP-52	50pcs PET裝盤	305x270mm	50pcs/1		
			以下空白			

主管：　王騏臻　　採購：　　倉管：

3.

確認圖紙

型號名稱:
BP-CR2032-M90-001
研揚料號:175011301K

公司名稱:				ITEM	DESCRIPTION(品名)	MATERIAL(材料規格)	COLOR	Q'TY	備註
研揚科技股份有限公司				1	電池	maxell CR2032H電池	銀色	1	
				2	電線不鏽鋼端子	304不鏽鋼0.1mm厚	銀色	2	
				3	電線材	UL1571#28(紅.黑絞線)	紅.黑	1	
圖號	BP-CR2032-M90-001			4	塑膠端子Connectoy Housing	Molex51021-0200	白	1	
日期	2016-9-11			5	端子Terminal	Molex50058-8000	銀	2	
單位	m/m	核准		6	PRINT DATE CODE		白		
比例		確認		7	熱收縮膜	內圈PET黑色.外套PET黑色	黑	1	
公差	±0.2	制圖	JOHN	8	熱收套管	HAMBURG H-2/H2(CB)	黑	2	T-7

4.

電池規格表
SGS報告書

C-07011

SPECIFICATIONS
FOR LITHIUM BATTERY
CR2032 H

maxell

Hitachi Maxell Global Ltd.

C-07011

Hitachi Maxell Global Ltd.

SPECIFICATIONS
FOR LITHIUM BATTERY

CR2032 H

APPROVED SIGNATURE :

YOUR NAME (Please Print) :

TITLE :

DATE :

Approved : 山本宏史

Date June 27, 2013

.. In order to confirm your acceptance of this specification, please return one copy signed by an appropriate authority.

.. Notice! Any order placed for the product's herein specified, after you have received this documents, will be taken as your acceptance of this specification.

1. Scope

These specifications are applicable to the manganese dioxide lithium batteries supplied by Hitachi Maxell Global Ltd.

2. Applicable Battery Type — Manganese dioxide Lithium Battery

3. Battery Type and Performance

3.1	Type	CR2032 H
3.2	Nominal voltage	3.0 volts
3.3	Nominal discharge capacity	240mAh(Load:15k ohm, End voltage 2.0V)
3.4	Outside dimensions	As per drawing attached
3.5	Standard weight	3.0g
3.6	Guarantee	1 year from manufacture date code.
3.7	Characteristics	
3.7.1	Open circuit voltage	Will satisfy the figure in Table 1.
3.7.2	Closed circuit voltage	Ditto
3.7.3	Service life	Ditto
3.7.4	Electrolyte leakage resistance	Ditto
3.8	Appearance	Will be free from flaw, stain, deformation, uneven tone, electrolyte leakage and other defects which impair the value of the commodity.
3.9	Brand	The brand name of "MAXELL" is used.
3.10	Symbol of manufactured month and year	Manufactured month and year will be shown on the surface of the battery. Example : 31 (Manufactured in January, 2013) 32 (Manufactured in February, 2013) 30 (Manufactured in October, 2013) 3Y (Manufactured in November, 2013) 4Z (Manufactured in December, 2014)

Table 1

1. Open circuit voltage

Initial	3.0 to 3.4 V
After 12 months storage	3.0 to 3.4 V

2. Closed circuit voltage

Load resistance	15,000 ohms
Discharge time	5 sec
Minimum voltage (Initial)	2.95 V
Minimum voltage (After 12 months storage)	2.90 V

3. Service life

Load resistance	15,000 ohms
Discharge method	24 hours / day
End voltage	2.0 V
Minimum duration (Initial)	965 hours
Minimum duration (After 12 months storage)	950 hours

4. Electrolyte leakage resistance

No electrolyte leakage will take place during a term of the test of Item 1 to Item 3 in table 1.

Initial test: A test commencing within one month after delivery.

Stored test: A test conducted after 12 months storage under the specified conditions after delivery.

4. Test

4.1 Temperature and Humidity.

4.1.1 Measurement conditions

Unless otherwise specified, the measurement will be executed at temperature of 20+/-2 deg. C and at relative humidity of 65+/-20%.

4.1.2 Storage conditions

Unless otherwise specified, the storage conditions for sample batteries will be at the temperature of less than 25 deg. C and at relative humidity of less than 75%.

The test after storage will be commenced within 1 month after storage.

4.2. Measuring instruments and devices

4.2.1 Voltage measurement will be carried out using the DC voltmeter which can measure from 0V to 4V. The precision of the voltmeter will be +/-1mV or more precise and the input impedance will be more than 10M ohm.

4.2.2 Load resistance will include all the resistance of the external circuit and its tolerance will be within 0.5%.

4.2.3 Dimension measurement will be carried out using the caliper whose measuring range is from 0mm to 150mm and precision is 5/100mm or more precise.

4.3. Test methods (Testing procedure)

4.3.1 Dimensions

Use the measuring instrument as specified in the Item 4.2.3.

4.3.2 Appearance

Examination will be carried out by visual inspection.

4.3.3 Open circuit voltage

Measure the voltage between both terminals using the voltmeter specified in the Item 4.2.1.

4.3.4 Service life

Leave the battery samples at the temperature of 20+/-5 deg. C for above 12 hours, and discharge them continuously through the discharge load specified in Table 1. Carry out the discharge test until the discharge voltage falls down to not less than the final voltage specified in Table 1, and the service life will be the discharge time while the discharge voltage keeps above the specified final voltage.

4.3.5 Electrolyte leakage resistance

Check the state of the leakage by the naked eye 30 cm away from them under the light of the 40 watt fluorescent lamp one meter above.

5. Limited warranty

(1) We certify that the battery shall comply with the specification defined in this document for 1 year from manufacture date code. This product, if defective in materials or workmanship, will be replaced free of charge, when returned to Hitachi Maxell, Ltd.
Replacement is the sole obligation under this warranty. This warranty expressly excludes incidental and consequential damages caused by use of, or inability to use, this product.

(2)When customer does any work on the battery except instructions in this specifications, for example wire is soldered to the tab or battery surface directly, Hitachi Maxell, Ltd. can not warrant any battery performance including safety and the customer shall undertake the responsibility of all damage caused by this battery.

(3)Confirm and assure the matching and reliability of batteries on actual set or unit application with customer's responsibility.

(4)In the case of the following situation, it will be assumed that Hitachi Maxell, Ltd. does not take responsibility

(i) When the appropriate handling, use, installation, or examination of batteries were not carried out.

(ii) When the instructions, attentions or warnings mentioned in this specification were not followed.

(iii)When the rational instructions or advice of Hitachi Maxell, Ltd. were not followed.

(iv) In case that the used condition of battery was not informed in advance.

(v) In case that the battery was applied for other application or different condition informed in advance.

6. Others

This battery is free of six chemical substance* subject to the RoHS directive.

*six chemical substances :

lead, mercury, cadmium, hexavalent chromium, bromic,
fire retardants(polybrominated biphenyl (PBB), polybrominated diphenyl (PBDE))
(As of Apr. 2013)

Safety and better use Instructions

This battery contains lithium, organic solvents, and other combustible materials. For this reason, improper handling of the battery could lead to distortion, leakage*, overheating, explosion, or fire, causing bodily injury or equipment trouble. Please observe the following instructions to prevent accidents.
(* Leakage is defined as the unintentional escape of a liquid from a battery.)

⚠ WARNING Handling

● **Never swallow.**
Always keep the battery out of the reach of infants and young children to prevent it from being swallowed. If swallowed, consult a physician immediately.

● **Never charge.**
The battery is not designed to be charged by any other electrical source. Charging could generate gas and internal short-circuiting, leading to distortion, leakage, overheating, explosion, or fire.

● **Never heat.**
Heating the battery to more than 100 deg.C* could increase the internal pressure, causing distortion, leakage, overheating, explosion, or fire. (* Consult Maxell regarding heat resistant coin type lithium manganese dioxide batteries.)

● **Never expose to open flames.**
Exposing to flames could cause the lithium metal to melt, causing the battery to catch on fire and explode .

● **Never disassemble the battery.**
Do not disassemble the battery, because the separator or gasket could be damaged, leading to distortion, leakage, overheating, explosion or fire.

● **Never reverse the positive and negative terminals when mounting.**
Improper mounting of the battery could lead to short-circuiting, charging or forced-discharging. This could cause distortion, leakage, overheating, explosion, or fire.

● **Never short-circuit the battery.**
Do not allow the positive and negative terminals to short-circuit. Never carry or store the battery with metal objects such as a necklace or a hairpin. Do not take multiple batteries out of the package and pile or mix them when storing. Otherwise, this could lead to distortion, leakage, overheating, explosion, or fire.

● Never weld the terminals or weld a wire to the body of the battery directly.
The heat of welding or soldering could cause the lithium to melt, or cause damage to the insulating material in the battery. This could cause distortion, leakage, overheating, explosion, or fire. When soldering the battery directly to equipment, solder only the tabs or leads. Even then, the temperature of the soldering iron must be below 350 deg. C and the soldering time less than 5 seconds. Do not use soldering bath, because the circuit board with battery attached could stop moving or the battery could drop into the bath. Moreover do not use excessive solder, because the solder could flow to unwanted portions of the board, leading to a short-circuit or charging of the battery.

● Never use different batteries together.
Using different batteries together, i.e. different type or used and new or different manufacturer could cause distortion, leakage, overheating, explosion, or fire because of the differences in battery property. If using two or more batteries connected in series or in parallel even same batteries, please consult with Maxell before using.

● Never allow liquid leaking from the battery to get in your eyes or mouth.
Because this liquid could cause serious damage, if it does come in contact with your eyes, flush them immediately with plenty of water and consult a physician. Likewise, if the liquid gets in your mouth, rinse immediately with plenty of water and consult physician.

●Keep leaking batteries away from fire.
If leakage is suspected or you detect a strong odor, keep the battery away from fire, because the leaked liquid could catch on fire.

● Never touch the battery electrodes.
Do not allow the battery electrodes to come in contact with your skin or fingers. Otherwise, the moisture from your skin could cause a discharge of the battery, which could produce certain chemical substances causing you to receive a chemical burns..

⚠ WARNING Circuit Design for Back-up Use

This is a primary battery and cannot be charged. If used in memory or RTC back-up applications, be sure to use diodes to prevent charging from the main power source or other batteries, and a protective resistor to regulate the current as shown in the figure below. Note that the points described below should be taken into careful consideration when selecting diodes and protective resistors.

Example (A)

Example (B)

● Supplied voltage to load
Because a diode and a resistor generate the voltage drop on operating, please take into consideration these voltage drops for supplied voltage to load.

● Using diodes to prevent charging
Please choose diodes with leak current as small as possible. Please keep the charged capacity due to leak current to within 1% of nominal capacity.

● Using and setting protective resistors
A protective resistor is used to prevent the battery from being charged by large surges of current during diode failure. Please set the resistor so that the maximum current shown in the right table is not exceeded. For example, say a CR2032 battery is used in sample circuit (A) in combination with a main power source 5 volt. Since the permitted charge current is 10mA and this battery's voltage is 3V, let the resistor be R ≧(5V-3V)/10mA=0.2k ohm, meaning that at least 0.2k ohm is required.

Type	Maximum Current
CR2450HR	15mA
CR2450HR-Ex	15mA
CR2050HR	10mA
CR2450	15mA
CR2430	15mA
CR2032H	10mA
CR2032	10mA
CR2025	10mA
CR2016	10mA
CR1632	4.0mA
CR1620	4.0mA
CR1616	2.5mA
CR1220	3.0mA
CR1216	2.5mA
CR1025	2.5mA

Note: If the diodes broke down, it is necessary for safety to replace them as soon as possible even though using a protective resistor. Considering the trouble of diodes and resistors, other safety measures should be incorporated in the circuit design.

⚠ WARNING Disposal

The battery may be regulated by national or local regulation. Please follow the instructions of proper regulation. As electric capacity is left in a discharded battery and it comes into contact with other metals, it could lead to distortion, leakage, overheating, or explosion, so make sure to cover the (+) and (-) terminals with friction tape or some other insulator before disposal.

Example of battery insulation

⚠ CAUTION Handling/Storage

● **Never expose the battery to ultrasonic sound.**
Exposing the battery to ultrasonic sound may cause short-circuiting because the inside material is broken into pieces, leading to distortion, leakage, overheating, explosion, or fire.

● **Never subject the battery to severe shock.**
Dropping, throwing or stomping on the battery may cause distortion, leakage, overheating, explosion, or fire.

● **Never short-circuit the battery while installing into equipment.**
Please be careful when installing the battery not to short-circuit it with metal portions of the equipment.

● Use the correct battery suitable for the equipment.
The battery may not be suitable for the specific equipment due to the using conditions or type of equipment. Please select the suitable battery according to the handling instructions of the equipment.

● Never use or leave the battery in a hot place such as under the direct rays of the sun or in a car in hot weather.
If you do, this may cause distortion, leakage, overheating, explosion, or fire .

● Never allow the battery to come in contact with water.
If it does, this may cause the battery to rust or lead to distortion, leakage, overheating, explosion, or fire.

● Never store the battery in hot and highly humid environment.
Doing so may cause the performance of the battery to deteriorate. In certain environments, this may lead to distortion, leakage, overheating, explosion or fire.

●Keep contact pressure more than 2N.
The battery voltage may be lower than intended value because of poor contact condition, please keep contact pressure more than 2N for suitable contact resistance.

DIMENSIONS : mm

		PROJECTION	SCALE	TITLE	SH.
			5/1	CR2032 H	—
REGD.	DWN. K. Yamagata May 27 '05	Hitachi Maxell,Ltd.	ONO WORKS DWG. NO.		REV.
	CHKD. T. Kudo May 27 '05	Ono Japan	01 4 2 2 3 5179		
	APPD. M. Nakano May 27 '05				

DIMENSIONS : mm

CR2032	PROJECTION	SCALE 5/1	TITLE Maxell Brand Marking Layout		SH. —
REGD.	DWN. J. Kimura Jun 19.01	Hitachi Maxell, Ltd. Ono Japan	ONO WORKS DWG. NO. 01422236348		REV.
	CHKD. A. Hirai Jun 19.01				
	APPD. Jun 19.01				

Coin Type Lithium Manganese Dioxide Battery

Overview

The coin-type lithium manganese dioxide battery (CR battery) is a small, lightweight battery with an operating voltage of 3V and the ability to operate over a wide temperature range. It has a wide range of applications, both for powering devices such as wristwatches and electronic calculators and can be used in all types of electronic devices mainly as memory and RTC backup.

Construction

Principle and Reactions

The coin-type lithium manganese dioxide battery uses manganese dioxide (MnO_2) as its positive active material, lithium (Li) as its negative active material, and an organic electrolyte solution.

Battery Reactions

Positive reaction: $MnO_2 + Li^+ + e^- \rightarrow MnOOLi$
Negative reaction: $Li \rightarrow Li^+ + e^-$
Total reaction: $MnO_2 + Li \rightarrow MnOOLi$

Features

Optimum for Memory and RTC Backup (Fig. 1)

Displays long-term stable operating voltage at low load discharge.

High 3 volt energy density

High energy density. At 3 volts (nominal voltage), it has about twice the voltage of alkaline button batteries and silver oxide batteries.

Stable discharge characteristics through low internal resistance and high operating voltage

Employs highly conductive electrolyte, lowering internal resistance and providing stable operating voltage. This allows stable power to be obtained, with little change in operating voltage at room temperature as well as high and low temperatures.

Superior leakage resistance and excellent storage characteristics (Fig. 2)

Employs a leak-resistant organic electrolyte, giving it better leakage resistance than battery types using alkaline electrolytes. Furthermore, the high degree of seal of the seal structure and application of sealant keep self-discharge to about 1% per year.

Superior high rate discharge characteristics (Fig. 3)

Fig. 1 Relationship between Discharge Current Consumption and Duration Time

Fig. 2 Discharge Characteristics after Storage

Fig. 3 High Rate Discharge Characteristics

UL Recognized Components

The coin-type lithium manganese dioxide battery is a UL (Underwriters Laboratories Inc.) recognized component and user replaceable.

Recognized models:
CR2450, CR2430, CR2032, CR2032H,CR2025, CR2016, CR1632, CR1620, CR1616, CR1220, CR1216, CR1025

Certification Number: MH12568

CR

Applications

- Communication Tags
- OA Machines (Fax, Copiers, Printers)
- PDAs
- Camcorders
- Portable CD/MD Players
- Electronic Meters (Water, Gas, Electricity)
- FA Instruments (Measuring Instruments, Onboard Microcomputers, Sensors)
- Notebook PCs
- Electronic Dictionaries
- Digital Still Cameras
- Watches
- Keyless Entry Systems
- Remote Controllers
- Desktop PCs
- Calculators
- Film Cameras
- Medical Instruments, Cash Registers
- Portable Game Devices

Products

Model		CR2450	CR2430	CR2032H	CR2032	CR2025	CR2016	CR1632	CR1620	CR1616	CR1220	CR1216	CR1025
Nominal Voltage (V)		3	3	3	3	3	3	3	3	3	3	3	3
Nominal Capacity (mAh)**		610	290	240	220	170	90	140	80	55	36	25	30
Nominal Discharge Current (mA)		0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Operating Temperature Range (deg. C)***		−20 to +85											
Dimensions*	Diameter (mm)	24.5	24.5	20.0	20.0	20.0	20.0	16.0	16.0	16.0	12.5	12.5	10.0
	Height (mm)	5.0	3.0	3.2	3.2	2.5	1.6	3.2	2.0	1.6	2.0	1.6	2.5
Weight (g)*		6.6	4.6	3.0	3.0	2.5	1.7	1.9	1.3	1.1	0.8	0.6	0.6

* Dimensions and weight are for the battery itself, but may vary depending on terminal specifications and other factors.
** Nominal capacity indicates duration until the voltage drops down to 2.0V when discharged at a nominal discharge current at 20 deg. C.
*** When using these batteries at temperatures outside the range of 0 to +40 deg. C, please consult Maxell in advance for conditions of use.
• Data and dimensions are just reference values. For further details, please contact your nearest Maxell dealer or distributor.

maxell
Ono Works: 5, Takumidai, Ono-shi, Hyogo 675-1322, Japan
Phone: (+81) 794-63-8054 Facsimile: (+81) 794-63-8058 http://www.maxell.co.jp

Certification

UN38-3-CR2032H-00-16

model name : CR2032H			
☑ Lithium metal cell or battery		☐ Lithium-ion cell or battery	
Lithium content		Watt-hour rating	
☑ cell	☐ battery(pack)	☐ cell	☐ battery(pack)
☑ ≦ 0.3g	☐ ≦ 0.3g	☐ ≦ 2.7Wh	☐ ≦ 2.7Wh
☐ ≦ 1g	☐ ≦ 2g	☐ ≦ 20Wh	☐ ≦ 100Wh
☐ ＞ 1g	☐ ＞ 2g	☐ ＞ 20Wh	☐ ＞ 100Wh
		Nominal Voltage	V
		Rated Capacity	mAh

Transport tests and results

Test number	Designation	Results	Remarks
T-1	Altitude	Accepted	
T-2	Thermal cycling	Accepted	
T-3	Vibration	Accepted	
T-4	Shock	Accepted	
T-5	External short circuit	Accepted	
T-6	Crush	Accepted	
T-7	Overcharge	Not applicable	for rechargeable battery only
T-8	Forced Discharge	Accepted	

We certify that above results are confirmed in accordance with the Manual of Tests and Criteria of the UN Recommendations on the Transport of Dangerous Goods(5th revised edition Amendment2), Part Ⅲ, sub-section 38.3

Name / Title of Signatory

Takashi Kimura / HEAD ENGINEER

Signature

T. Kimura

1-Jan-2016

HITACHI MAXELL GLOBAL LTD. 日立麥克斯爾國際有限公司

Test	T.1: Altitude simulation

Test procedure

Test cells shall be stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature (20 ± 5 °C).

Criteria

There is no mass loss, no leakage, no venting, no disassembly, no rupture and no fire.
The open circuit voltage of each test cell after testing is not less than 90% of its voltage immediately prior to this procedure. (Undischarged status only)

*1: Voltage change[%]=V_2/V_1 x 100

*2: Mass loss[%]=$(M_1-M_2)/M_1$x 100

Status	Undischarged	Number of test specimen: 10

Test result

No.		1	2	3	4	5	6	7	8	9	10
Initial	Voltage(V_1) [V]	3.284	3.290	3.291	3.295	3.286	3.289	3.292	3.277	3.291	3.288
	Mass(M_1) [g]	3.018	3.020	3.022	3.038	3.017	3.004	3.027	3.012	3.002	2.978
After Test	Voltage(V_2) [V]	3.284	3.290	3.291	3.295	3.286	3.290	3.293	3.277	3.291	3.289
	Voltage change*1 [%]	100	100	100	100	100	100	100	100	100	100
	Mass(M_2) [g]	3.018	3.020	3.022	3.038	3.017	3.003	3.026	3.012	3.002	2.978
	Mass loss*2 [%]	0	0	0	0	0	0	0	0	0	0
	Leakage	No	No	No	No	No	No	No	No	No	No
	Venting	No	No	No	No	No	No	No	No	No	No
	Disassembly	No	No	No	No	No	No	No	No	No	No
	Rupture	No	No	No	No	No	No	No	No	No	No
	Fire	No	No	No	No	No	No	No	No	No	No

Status	Fully discharged	Number of test specimen: 10

Test result

No.		1	2	3	4	5	6	7	8	9	10
Initial	Voltage(V_1) [V]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mass(M_1) [g]	3.027	3.013	3.009	3.005	3.043	3.027	3.015	3.013	3.027	2.992
After Test	Voltage(V_2) [V]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Voltage change*1 [%]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mass(M_2) [g]	3.027	3.013	3.009	3.005	3.043	3.027	3.015	3.013	3.027	2.992
	Mass loss*2 [%]	0	0	0	0	0	0	0	0	0	0
	Leakage	No	No	No	No	No	No	No	No	No	No
	Venting	No	No	No	No	No	No	No	No	No	No
	Disassembly	No	No	No	No	No	No	No	No	No	No
	Rupture	No	No	No	No	No	No	No	No	No	No
	Fire	No	No	No	No	No	No	No	No	No	No

N/A: Not Applicable

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Test	T.2: Thermal test

Test procedure

Test cells are to be stored for at least six hours at a test temperature equal to 75 ± 2 °C, followed by storage for at least six hours at a test temperature equal to - 40 ± 2 °C. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated 10 times, after which all test cells are to be stored for 24 hours at ambient

Criteria

There is no mass loss, no leakage, no venting, no disassembly, no rupture and no fire. The open circuit voltage of each test cell after testing is not less than 90% of its voltage immediately prior to this procedure. (Undischarged status only)

*1: Voltage change[%]=V_2/V_1 x 100

*2: Mass loss[%]=$(M_1-M_2)/M_1$x 100

Status	Undischarged	Number of test specimen: 10

Test result

No.		1	2	3	4	5	6	7	8	9	10
Initial	Voltage(V_1) [V]	3.284	3.290	3.291	3.295	3.286	3.290	3.293	3.277	3.291	3.289
	Mass(M_1) [g]	3.018	3.020	3.022	3.038	3.017	3.003	3.026	3.012	3.002	2.978
After Test	Voltage(V_2) [V]	3.280	3.284	3.285	3.285	3.281	3.283	3.286	3.276	3.286	3.284
	Voltage change*1 [%]	100	100	100	100	100	100	100	100	100	100
	Mass(M_2) [g]	3.018	3.020	3.022	3.037	3.017	3.002	3.026	3.012	3.001	2.978
	Mass loss*2 [%]	0	0	0	0	0	0	0	0	0	0
	Leakage	No	No	No	No	No	No	No	No	No	No
	Venting	No	No	No	No	No	No	No	No	No	No
	Disassembly	No	No	No	No	No	No	No	No	No	No
	Rupture	No	No	No	No	No	No	No	No	No	No
	Fire	No	No	No	No	No	No	No	No	No	No

Status	Fully discharged	Number of test specimen: 10

Test result

No.		1	2	3	4	5	6	7	8	9	10
Initial	Voltage(V_1) [V]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mass(M_1) [g]	3.027	3.013	3.009	3.005	3.043	3.027	3.015	3.013	3.027	2.992
After Test	Voltage(V_2) [V]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Voltage change*1 [%]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mass(M_2) [g]	3.027	3.013	3.008	3.005	3.042	3.027	3.015	3.013	3.027	2.992
	Mass loss*2 [%]	0	0	0	0	0	0	0	0	0	0
	Leakage	No	No	No	No	No	No	No	No	No	No
	Venting	No	No	No	No	No	No	No	No	No	No
	Disassembly	No	No	No	No	No	No	No	No	No	No
	Rupture	No	No	No	No	No	No	No	No	No	No
	Fire	No	No	No	No	No	No	No	No	No	No

N/A: Not Applicable

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Test	T.3: Vibration

Test procedure

Cells are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face.
The logarithmic frequency sweep is as follows: from 7 Hz a peak acceleration of 1 g_n is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8 g_n occurs (approximately 50 Hz). A peak acceleration of 8 gn is then maintained until the frequency is increased to 200 Hz.

Criteria

There is no mass loss, no leakage, no venting, no disassembly, no rupture and no fire.
The open circuit voltage of each test cell after testing is not less than 90% of its voltage immediately prior to this procedure. (Undischarged status only)

*1: Voltage change[%]=V_2/V_1 x 100

*2: Mass loss[%]=$(M_1-M_2)/M_1$x 100

Status	Undischarged	Number of test specimen: 10

Test result

No.		1	2	3	4	5	6	7	8	9	10
Initial	Voltage(V_1) [V]	3.280	3.284	3.285	3.285	3.281	3.283	3.286	3.276	3.286	3.284
	Mass(M_1) [g]	3.018	3.020	3.022	3.037	3.017	3.002	3.026	3.012	3.001	2.978
After Test	Voltage(V_2) [V]	3.297	3.299	3.299	3.303	3.301	3.301	3.304	3.291	3.302	3.302
	Voltage change*1 [%]	101	100	100	101	101	101	101	100	100	101
	Mass(M_2) [g]	3.018	3.020	3.021	3.037	3.016	3.003	3.026	3.012	3.001	2.978
	Mass loss*2 [%]	0	0	0	0	0	0	0	0	0	0
	Leakage	No	No	No	No	No	No	No	No	No	No
	Venting	No	No	No	No	No	No	No	No	No	No
	Disassembly	No	No	No	No	No	No	No	No	No	No
	Rupture	No	No	No	No	No	No	No	No	No	No
	Fire	No	No	No	No	No	No	No	No	No	No

Status	Fully discharged	Number of test specimen: 10

Test result

No.		1	2	3	4	5	6	7	8	9	10
Initial	Voltage(V_1) [V]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mass(M_1) [g]	3.027	3.013	3.008	3.005	3.042	3.027	3.015	3.013	3.027	2.992
After Test	Voltage(V_2) [V]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Voltage change*1 [%]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mass(M_2) [g]	3.027	3.013	3.008	3.005	3.042	3.027	3.015	3.013	3.026	2.991
	Mass loss*2 [%]	0	0	0	0	0	0	0	0	0	0
	Leakage	No	No	No	No	No	No	No	No	No	No
	Venting	No	No	No	No	No	No	No	No	No	No
	Disassembly	No	No	No	No	No	No	No	No	No	No
	Rupture	No	No	No	No	No	No	No	No	No	No
	Fire	No	No	No	No	No	No	No	No	No	No

N/A: Not Applicable

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Test	T.4: Shock

Test procedure

Test cells shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery. Each cell shall be subjected to a half-sine shock of peak acceleration of 150 g_n and pulse duration of 6 milliseconds. Each cell shall be subjected to three shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicular mounting positions of the cell for a total of 18 shocks.

Criteria

There is no mass loss, no leakage, no venting, no disassembly, no rupture and no fire. The open circuit voltage of each test cell after testing is not less than 90% of its voltage immediately prior to this procedure. (Undischarged status only)

*1: Voltage change[%]=V_2/V_1 x 100

*2: Mass loss[%]=$(M_1-M_2)/M_1$x 100

Status	Undischarged	Number of test specimen: 10

Test result

No.		1	2	3	4	5	6	7	8	9	10
Initial	Voltage(V_1) [V]	3.297	3.299	3.299	3.303	3.301	3.301	3.304	3.291	3.302	3.302
	Mass(M_1) [g]	3.018	3.020	3.021	3.037	3.016	3.003	3.026	3.012	3.001	2.978
After Test	Voltage(V_2) [V]	3.301	3.304	3.301	3.304	3.305	3.303	3.309	3.294	3.306	3.307
	Voltage change*1 [%]	100	100	100	100	100	100	100	100	100	100
	Mass(M_2) [g]	3.018	3.019	3.021	3.037	3.016	3.003	3.025	3.012	3.001	2.977
	Mass loss*2 [%]	0	0	0	0	0	0	0	0	0	0
	Leakage	No	No	No	No	No	No	No	No	No	No
	Venting	No	No	No	No	No	No	No	No	No	No
	Disassembly	No	No	No	No	No	No	No	No	No	No
	Rupture	No	No	No	No	No	No	No	No	No	No
	Fire	No	No	No	No	No	No	No	No	No	No

Status	Fully discharged	Number of test specimen: 10

Test result

No.		1	2	3	4	5	6	7	8	9	10
Initial	Voltage(V_1) [V]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mass(M_1) [g]	3.027	3.013	3.008	3.005	3.042	3.027	3.015	3.013	3.026	2.991
After Test	Voltage(V_2) [V]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Voltage change*1 [%]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mass(M_2) [g]	3.027	3.013	3.008	3.005	3.042	3.027	3.015	3.013	3.027	2.991
	Mass loss*2 [%]	0	0	0	0	0	0	0	0	0	0
	Leakage	No	No	No	No	No	No	No	No	No	No
	Venting	No	No	No	No	No	No	No	No	No	No
	Disassembly	No	No	No	No	No	No	No	No	No	No
	Rupture	No	No	No	No	No	No	No	No	No	No
	Fire	No	No	No	No	No	No	No	No	No	No

N/A: Not Applicable

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Test	T.5: External short circuit

Test procedure

The cell to be tested shall be temperature stabilized so that its external case temperature reaches 55 ± 2 °C and then the cell shall be subjected to a short circuit condition with a total external resistance of less than 0.1 ohm at 55 ± 2 °C. This short circuit condition is continued for at least one hour after the cell external case temperature has returned to 55 ± 2 °C. The cell must be observed for a further six hours for the test to be concluded.

Criteria

Cells' external temperature does not exceed 170 °C and there is no disassembly, no rupture and no fire within six hours of this test.

Status	Undischarged	Number of test specimen: 10

Test result

No.		1	2	3	4	5	6	7	8	9	10
Initial	Voltage [V]	3.301	3.304	3.301	3.304	3.305	3.303	3.309	3.294	3.306	3.307
	Mass [g]	3.018	3.019	3.021	3.037	3.016	3.003	3.025	3.012	3.001	2.977
Max. Temperature [°C]		60.0	60.6	60.1	60.5	60.2	60.0	59.1	60.1	60.0	60.0
After Test	Leakage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Venting	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Disassembly	No	No	No	No	No	No	No	No	No	No
	Rupture	No	No	No	No	No	No	No	No	No	No
	Fire	No	No	No	No	No	No	No	No	No	No

Status	Fully discharged	Number of test specimen: 10

Test result

No.		1	2	3	4	5	6	7	8	9	10
Initial	Voltage [V]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mass [g]	3.027	3.013	3.008	3.005	3.042	3.027	3.015	3.013	3.027	2.991
Max. Temperature [°C]		55.2	55.2	55.0	55.0	55.1	55.0	55.2	55.5	55.8	55.9
After Test	Leakage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Venting	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Disassembly	No	No	No	No	No	No	No	No	No	No
	Rupture	No	No	No	No	No	No	No	No	No	No
	Fire	No	No	No	No	No	No	No	No	No	No

N/A: Not Applicable

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Test	T.6: Impact

Test procedure

The test sample cell is to be placed on a flat surface. A 15.8 mm diameter bar is to be placed across the centre of the sample. A 9.1 kg mass is to be dropped from a height of 61 ± 2.5 cm onto the sample.

A cylindrical or prismatic cell is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8 mm diameter curved surface lying across the centre of the test sample. A prismatic cell is also to be rotated 90 degrees around its longitudinal axis so that both the wide and narrow sides will be subjected to the impact. Each sample is to be subjected to only a single impact. Separate samples are to be

Criteria

Cells' external temperature does not exceed 170 °C and there is no disassembly and no fire within six hours of this test.

Status	Undischarged	Number of test specimen: 5

Test result

No.		1	2	3	4	5	6	7	8	9	10
Initial	Voltage [V]	3.284	3.278	3.282	3.293	3.290	–	–	–	–	–
	Mass [g]	3.015	3.013	3.018	3.022	3.008	–	–	–	–	–
Max. Temperature [°C]		90℃>	90℃>	90℃>	90℃>	90℃>	—	—	—	—	—
After Test	Leakage	N/A	N/A	N/A	N/A	N/A	–	–	–	–	–
	Venting	N/A	N/A	N/A	N/A	N/A	–	–	–	–	–
	Disassembly	No	No	No	No	No	–	–	–	–	–
	Rupture	N/A	N/A	N/A	N/A	N/A	–	–	–	–	–
	Fire	No	No	No	No	No	–	–	–	–	–

Status	Fully discharged	Number of test specimen: 5

Test result

No.		1	2	3	4	5	6	7	8	9	10
Initial	Voltage [V]	N/A	N/A	N/A	N/A	N/A	—	—	—	—	—
	Mass [g]	3.011	3.014	3.013	3.009	3.033	—	—	—	—	—
Max. Temperature [°C]		90℃>	90℃>	90℃>	90℃>	90℃>	—	—	—	—	—
After Test	Leakage	N/A	N/A	N/A	N/A	N/A	–	–	–	–	–
	Venting	N/A	N/A	N/A	N/A	N/A	–	–	–	–	–
	Disassembly	No	No	No	No	No	–	–	–	–	–
	Rupture	N/A	N/A	N/A	N/A	N/A	–	–	–	–	–
	Fire	No	No	No	No	No	–	–	–	–	–

N/A: Not Applicable

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Test	T.8: Forced discharge

Test procedure

Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12 V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer.

The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell shall be forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current(in

Criteria

There is no disassembly and no fire within seven days of the test.

Status	Fully discharged	Number of test specimen: 10

Test result

No.		1	2	3	4	5	6	7	8	9	10
Initial	Voltage [V]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mass [g]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
After Test	Leakage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Venting	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Disassembly	No	No	No	No	No	No	No	No	No	No
	Rupture	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Fire	No	No	No	No	No	No	No	No	No	No

N/A: Not Applicable

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See General Information for Lithium Batteries - Component

HITACHI MAXELL LTD
ONO WORKS
5 TAKUMIDAI
ONO-SHI, HYOGO 675-1322 JAPAN

MH12568

Model No.	Primary Type[a]	Max Abnormal Charging Current mA	Max Abnormal Charging Voltage, V dc	Replacement [b],[c]
2CR17450AH*	Lithium/manganese dioxide (Cylindrical)	20	24	Technician
2ER17/33*	Lithium thionyl chloride (Cylindrical)	20	12	Technician
2ER3*	Lithium thionyl chloride (Cylindrical)	20	12	Technician
2ER6C*	Lithium thionyl chloride (Cylindrical)	20	12	Technician
2ER6K*	Lithium thionyl chloride (Cylindrical)	20	12	Technician
CR1025*	Lithium/manganese dioxide (Coin)	2.5	12	User
CR1216*	Lithium/manganese dioxide (Coin)	2.5	12	User
CR1220*	Lithium/manganese dioxide (Coin)	3	12	User
CR1616 (P)	Lithium/manganese dioxide (Coin)	4	-	User
CR1616*	Lithium/manganese dioxide (Coin)	2.5	12	User
CR1620	Lithium/manganese dioxide (Coin)	4	12	User
CR1620*	Lithium/manganese dioxide (Coin)	4	12	User
CR1620*@	Lithium/manganese dioxide (Coin)	2.5	12	User
CR1632*	Lithium/manganese dioxide (Coin)	4	12	User
CR17335*	Lithium/manganese dioxide (Cylindrical)	20	12	Technician
CR17450*	Lithium/manganese dioxide (Cylindrical)	20	12	Technician
CR17450-2*	Lithium/manganese dioxide (Cylindrical)	20	12	Technician
CR17450AH*	Lithium/manganese dioxide (Cylindrical)	20	12	Technician
CR2012	Lithium/manganese dioxide (Coin)	2.5	12	User
CR2012*	Lithium/manganese dioxide (Coin)	2.5	12	User
CR2016*	Lithium/manganese dioxide (Coin)	10	12	User
CR2025*	Lithium/manganese dioxide (Coin)	10	12	User
CR2025A*	Lithium/manganese dioxide (Coin)	5	12	User
CR2032	Lithium/manganese dioxide (Coin)	10	12	User
CR2032*	Lithium/manganese dioxide (Coin)	10	12	User
CR2032H*	Lithium/manganese dioxide (Coin)	10	12	User
CR2032HA*	Lithium/manganese dioxide (Coin)	10	12	Technician
CR2050HR*	Lithium/manganese dioxide (Coin)	15	12	Technician
CR2430*	Lithium/manganese dioxide (Coin)	15	12	User
CR2450*	Lithium/manganese dioxide (Coin)	15	12	Technician
CR2450@	Lithium/manganese dioxide (Coin)	100	12	User
CR2450HR*	Lithium/manganese dioxide (Coin)	15	12	Technician

CR2450HR-Ex*	Lithium/manganese dioxide (Coin)	15	12	Technician
ER10/28*	Lithium thionyl chloride	20	12	Technician
ER17/33*	Lithium thionyl chloride	20	12	Technician
ER17/33A*	Lithium thionyl chloride (Cylindrical)	20	12	Technician
ER17/33M*	Lithium thionyl chloride (Cylindrical)	20	12	Technician
ER17/50*	Lithium thionyl chloride	20	12	Technician
ER17/50H T-2 WP	Lithium thionyl chloride (Cylindrical)	20	12	Technician
ER17/50H*	Lithium thionyl chloride (Cylindrical)	20	12	Technician
ER18/50 T-2*	Lithium thionyl chloride	40	12	Technician
ER18/50*	Lithium thionyl chloride	20	12	Technician
ER3*	Lithium thionyl chloride	20	12	Technician
ER3A*	Lithium thionyl chloride	20	12	Technician
ER3K*	Lithium thionyl chloride	20	12	Technician
ER3S*	Lithium thionyl chloride (Cylindrical)	20	12	Technician
ER3SR*	Lithium thionyl chloride (Cylindrical)	20	12	Technician
ER6*	Lithium thionyl chloride (Cylindrical)	20	12	Technician
ER6A*	Lithium thionyl chloride (Cylindrical)	20	12	Technician
ER6AK*	Lithium thionyl chloride (Cylindrical)	20	12	Technician
ER6C*	Lithium thionyl chloride (Cylindrical)	20	12	Technician
ER6CA*	Lithium thionyl chloride (Cylindrical)	20	12	Technician
ER6CM*	Lithium thionyl chloride (Cylindrical)	20	12	Technician
ER6K*	Lithium thionyl chloride (Cylindrical)	20	12	Technician
ER6K-2*	Lithium thionyl chloride (Cylindrical)	20	12	Technician
ER6M*	Lithium thionyl chloride (Cylindrical)	20	12	Technician

Model No.	**Secondary Type[d]**	**Max Charging Current (Ic), mA**	**Max Charging Voltage, V dc[e]**	**Test Compliance[f]**
CLB2016*	Lithium ion (Coin)	30	4.4	1
CLB2032*	Lithium ion (Coin)	70	4.4	1
CLB3032*	Lithium ion (Coin)	200	4.4	1
CR1220	Lithium ion (Coin)	300	12	1
CR1616 (S)	Lithium ion (Coin)	2.5	12	1
CR1620 (S)	Lithium ion (Coin)	2.5	12	1
CR2016	Lithium ion (Coin)	10	12	1
CR2025	Lithium ion (Coin)	10	12	1
CR2032 (S)	Lithium ion (Coin)	10	12	1
CR2430 (S)	Lithium ion (Coin)	15	12	1
ICP043048G+	Lithium ion (Prismatic)	80	12	1
ICP043048GK+	Lithium ion (Prismatic)	720	4.6	1
ICP043048GKPA01+	Lithium ion (Prismatic)	720	4.6	1
ICP043048GPA01+	Lithium ion (Prismatic)	560	12	1
ICP043450GK+	Lithium ion (Prismatic)	840	4.6	1
ICP043450GKPA01+	Lithium ion (Prismatic)	840	12	1
ICP051820G+	Lithium ion (Prismatic)	150	4.4	1
ICP051820GPA01+	Lithium ion (Prismatic)	150	12	1
ICP053048GL+	Lithium ion (Prismatic)	860	4.6	1
ICP053048GLPA01+	Lithium ion (Prismatic)	860	4.6	1

ICP053436GKR+	Lithium ion (Prismatic)	720	4.6	1
ICP053436GKRPA01+	Lithium ion (Prismatic)	720	4.6	1
ICP053443GKRS+	Lithium ion (Prismatic)	840	4.4	1
ICP053443GKRSPA01+	Lithium ion (Prismatic)	840	12	1
ICP053450GH+	Lithium ion (Prismatic)	1000	4.6	1
ICP053450GHPA01+	Lithium ion (Prismatic)	1000	4.6	1
ICP063443GKRS+	Lithium ion (Prismatic)	1000	4.6	1
ICP063443GKRSPA01+	Lithium ion (Prismatic)	1000	12	1
ICP103443SRMU+	Lithium ion (Prismatic)	1600	4.6	1
ICP103443SRMUPA01+	Lithium ion (Prismatic)	1600	4.6	1
ICP103444AHRU	(Prismatic)	1900	4.4	1
ICP383450GK+	Lithium ion (Prismatic)	700	4.4	1
ICP383450GKPA01+	Lithium ion (Prismatic)	700	12	1
ICP384461XR+	Lithium ion (Prismatic)	1160	4.5	1
ICP384461XRPA01+	Lithium ion (Prismatic)	1160	12	1
ICP395158AHR+	Lithium ion (Prismatic)	1500	4.5	1
ICP403450AR+	Lithium ion (Prismatic)	820	4.4	1
ICP403450ARPA01+	Lithium ion (Prismatic)	820	12	1
ICP404251XR+	Lithium ion (Prismatic)	1020	4.5	1
ICP404251XRPA01+	Lithium ion (Prismatic)	1020	12	1
ICP405158HR+	Lithium ion (Prismatic)	1530	4.5	1
ICP405362HR	Lithium ion (Prismatic)	1700	4.5	1
ICP415168AHR+	Lithium ion (Prismatic)	1900	4.6	1
ICP423861SR+	Lithium ion (Prismatic)	1100	4.4	1
ICP423861SRPA01+	Lithium ion (Prismatic)	1100	12	1
ICP423984WR+	Lithium ion (Prismatic)	1860	4.6	1
ICP424261XS+	Lithium ion (Prismatic)	1300	4.4	1
ICP424261XSPA01+	Lithium ion (Prismatic)	1300	12	1
ICP425160ZR	Lithium ion (Prismatic)	1570	4.5	1
ICP425160ZR+	Lithium ion (Prismatic)	1570	4.5	1
ICP425262AHR+	Lithium ion (Prismatic)	1800	4.5	1
ICP433446ASM+	Lithium ion (Prismatic)	1000	4.45	1
ICP433446ASM+ $$	Lithium ion (Prismatic)	1000	4.45	1
ICP433446ASMPA01+	Lithium ion (Prismatic)	1000	4.45	1
ICP433446ASMPA01+ $$	Lithium ion (Prismatic)	1000	4.45	1
ICP434354ZR+	Lithium ion (Prismatic)	1260	4.5	1
ICP444355AZR	Lithium ion (Prismatic)	1360	4.5	1
ICP444355AZR+	Lithium ion (Prismatic)	1360	4.5	1
ICP446584AHR+	Lithium ion (Prismatic)	3200	4.5	1
ICP454055XR+	Lithium ion (Prismatic)	1120	4.6	1
ICP463048ASM+	Lithium ion (Prismatic)	1000	4.6	1
ICP463048ASM+ $$	Lithium ion (Prismatic)	1000	4.6	1
ICP463048ASMPA01+	Lithium ion (Prismatic)	1000	12	1
ICP463048ASMPA01+ $$	Lithium ion (Prismatic)	1000	12	1
ICP463048XS+	Lithium ion (Prismatic)	750	4.5	1
ICP463443AR+	Lithium ion (Prismatic)	750	4.4	1
ICP463443ARM+	Lithium ion (Prismatic)	1000	4.6	1

ICP463443ARM+ $$	Lithium ion (Prismatic)	1000	4.6	1
ICP463443ARMPA01+	Lithium ion (Prismatic)	1000	12	1
ICP463443ARMPA01+ $$	Lithium ion (Prismatic)	1000	12	1
ICP463443ARPA01+	Lithium ion (Prismatic)	750	12	1
ICP463443SR+	Lithium ion (Prismatic)	790	4.4	1
ICP463443SRMU+	Lithium ion (Prismatic)	1000	4.45	1
ICP463443SRMUPA01+	Lithium ion (Prismatic)	1000	12	1
ICP463443SRPA01+	Lithium ion (Prismatic)	790	12	1
ICP463443XS+	Lithium ion (Prismatic)	780	4.6	1
ICP463446AR+	Lithium ion (Prismatic)	820	4.4	1
ICP463446AR+ $$	Lithium ion (Prismatic)	820	4.4	1
ICP463446ARPA01+	Lithium ion (Prismatic)	820	12	1
ICP463446ARPA01+ $$	Lithium ion (Prismatic)	820	12	1
ICP463446ARU+	Lithium ion (Prismatic)	820	4.4	1
ICP463446ARUPA01+	Lithium ion (Prismatic)	820	12	1
ICP463446XRU+	Lithium ion (Prismatic)	920	4.5	1
ICP463446XRUPA01+	Lithium ion (Prismatic)	920	12	1
ICP463450AR+	Lithium ion (Prismatic)	920	4.4	1
ICP463450ARM+	Lithium ion (Prismatic)	1000	4.6	1
ICP463450ARMPA01+	Lithium ion (Prismatic)	1000	12	1
ICP463450ARMU+	Lithium ion (Prismatic)	1000	4.6	1
ICP463450ARMUPA01+	Lithium ion (Prismatic)	1000	12	1
ICP463450ARPA01+	Lithium ion (Prismatic)	920	12	1
ICP463450ARU+	Lithium ion (Prismatic)	920	4.4	1
ICP463450SR+	Lithium ion (Prismatic)	960	4.4	1
ICP463450SRPA01+	Lithium ion (Prismatic)	960	12	1
ICP463651AR+	Lithium ion (Prismatic)	960	4.4	1
ICP463651ARPA01+	Lithium ion (Prismatic)	960	12	1
ICP463651ARU+	Lithium ion (Prismatic)	960	4.4	1
ICP463651ARUPA01+	Lithium ion (Prismatic)	960	12	1
ICP463651XRU+	Lithium ion (Prismatic)	1020	4.5	1
ICP463651XRUPA01+	Lithium ion (Prismatic)	1020	12	1
ICP464461SRMU+	Lithium ion (Prismatic)	1450	4.4	1
ICP464461SRMUPA01+	Lithium ion (Prismatic)	1450	12	1
ICP464461ZRU+	Lithium ion (Prismatic)	1520	4.4	1
ICP464656ZR+	Lithium ion (Prismatic)	1570	4.5	1
ICP465156HR+	Lithium ion (Prismatic)	1730	4.5	1
ICP474350XRU+	Lithium ion (Prismatic)	1230	4.4	1
ICP474350XRUPA01+	Lithium ion (Prismatic)	1230	12	1
ICP474354ZR+	Lithium ion (Prismatic)	1430	4.5	1
ICP474354ZRPA01+	Lithium ion (Prismatic)	1430	12	1
ICP474862ZR	Lithium ion (Prismatic)	1800	4.5	1
ICP474862ZR+	Lithium ion (Prismatic)	1800	4.5	1
ICP483640SR+	Lithium ion (Prismatic)	820	4.4	1
ICP483640SRPA01+	Lithium ion (Prismatic)	820	12	1
ICP483640SRU+	Lithium ion (Prismatic)	820	4.4	1
ICP483640SRUPA01+	Lithium ion (Prismatic)	820	12	1

ICP483647AZR	Lithium ion (Prismatic)	1050	4.5	1
ICP484350HRU	Lithium ion (Prismatic)	1330	4.6	1
ICP484461HSU+	Lithium ion (Prismatic)	1700	3.5	1
ICP484461XR+	Lithium ion (Prismatic)	1540	4.5	1
ICP484461XRPA01+	Lithium ion (Prismatic)	1540	12	1
ICP484461ZR	Lithium ion (Prismatic)	1700	4.5	1
ICP484461ZR+	Lithium ion (Prismatic)	1700	4.5	1
ICP484461ZSU+	Lithium ion (Prismatic)	1700	4.5	1
ICP485049ZRU+	Lithium ion (Prismatic)	1500	4.4	1
ICP485155HRU+	Lithium ion (Prismatic)	1810	4.60	1
ICP485155ZR+	Lithium ion (Prismatic)	1710	4.5	1
ICP493365XRU+	Lithium ion (Prismatic)	1270	4.4	1
ICP493861SRU+	Lithium ion (Prismatic)	1350	4.4	1
ICP493861SRUPA01+	Lithium ion (Prismatic)	1350	12	1
ICP494261SRU+	Lithium ion (Prismatic)	1500	4.4	1
ICP494261SRUPA01+	Lithium ion (Prismatic)	1500	12	1
ICP503442SR+	Lithium ion (Prismatic)	820	4.4	1
ICP503442SRPA01+	Lithium ion (Prismatic)	820	12	1
ICP504553ZS+	Lithium ion (Prismatic)	1500	4.4	1
ICP505181AQS	Lithium ion (Prismatic)	4500	4.6	1
ICP505457AHRU+	Lithium ion (Prismatic)	2100	4.6	1
ICP514657AHSU	Lithium ion (Prismatic)	1860	4.6	1
ICP514657HSU	Lithium ion (Prismatic)	1800	4.6	1
ICP514657ZS+	Lithium ion (Prismatic)	1720	4.5	1
ICP5148657ZS	Lithium ion (Prismatic)	1720	4.5	1
ICP515148ZR+	Lithium ion (Prismatic)	1610	4.5	1
ICP515148ZRPA01+	Lithium ion (Prismatic)	1610	12	1
ICP515148ZRU+	Lithium ion (Prismatic)	1610	4.5	1
ICP515161HR+	Lithium ion (Prismatic)	2100	4.5	1
ICP515761AHR+	Lithium ion (Prismatic)	2600	4.5	1
ICP523446ASM+	Lithium ion (Prismatic)	1000	4.45	1
ICP523446ASMPA01		100	4.45	1
ICP533640SR+	Lithium ion (Prismatic)	900	4.4	1
ICP533640SR+ $$	Lithium ion (Prismatic)	900	4.4	1
ICP533640SRPA01+	Lithium ion (Prismatic)	900	12	1
ICP533640SRPA01+ $$	Lithium ion (Prismatic)	900	12	1
ICP533640SRU+	Lithium ion (Prismatic)	900	4.4	1
ICP533640SRUPA01+	Lithium ion (Prismatic)	900	12	1
ICP534553ZSU+	Lithium ion (Prismatic)	1640	4.4	1
ICP535154WR+	Lithium ion (Prismatic)	2000	4.6	1
ICP535156HR	Lithium ion (Prismatic)	2000	4.5	1
ICP535164HR+	Lithium ion (Prismatic)	2300	4.5	1
ICP545478AHR+	Lithium ion (Prismatic)	3200	4.50	1
ICP553048ASM+	Lithium ion (Prismatic)	1000	4.6	1
ICP553048ASMPA01+	Lithium ion (Prismatic)	1000	12	1
ICP553443AR+	Lithium ion (Prismatic)	920	4.4	1
ICP553443AR+ $$	Lithium ion (Prismatic)	920	4.4	1

ICP553443ARPA01+	Lithium ion (Prismatic)	920	12	1
ICP553443ARPA01+ $$	Lithium ion (Prismatic)	920	12	1
ICP553443ARU+	Lithium ion (Prismatic)	920	4.4	1
ICP553443ARU+ $$	Lithium ion (Prismatic)	920	4.4	1
ICP553443ARUPA01+	Lithium ion (Prismatic)	920	12	1
ICP553443ARUPA01+ $$	Lithium ion (Prismatic)	920	12	1
ICP553443SR+	Lithium ion (Prismatic)	950	4.4	1
ICP553443SRMU+	Lithium ion (Prismatic)	950	4.45	1
ICP553443SRMU+ $$	Lithium ion (Prismatic)	950	4.45	1
ICP553443SRMUPA01+	Lithium ion (Prismatic)	950	12	1
ICP553443SRMUPA01+ $$	Lithium ion (Prismatic)	950	12	1
ICP553443SRPA01+	Lithium ion (Prismatic)	950	12	1
ICP553446AR+	Lithium ion (Prismatic)	1000	4.4	1
ICP553446ARPA01+	Lithium ion (Prismatic)	1000	12	1
ICP553446ARU+	Lithium ion (Prismatic)	1000	4.4	1
ICP553446ARUPA01+	Lithium ion (Prismatic)	1000	12	1
ICP553450AR+	Lithium ion (Prismatic)	1100	4.4	1
ICP553450AR+ $$	Lithium ion (Prismatic)	1100	4.4	1
ICP553450ARM+	Lithium ion (Prismatic)	1100	4.4	1
ICP553450ARM+ $$	Lithium ion (Prismatic)	1100	4.6	1
ICP553450ARMPA01+	Lithium ion (Prismatic)	1100	12	1
ICP553450ARMPA01+ $$	Lithium ion (Prismatic)	1100	12	1
ICP553450ARPA01+	Lithium ion (Prismatic)	1100	12	1
ICP553450ARPA01+ $$	Lithium ion (Prismatic)	1100	12	1
ICP553450SR+	Lithium ion (Prismatic)	1150	4.4	1
ICP553450SRM+	Lithium ion (Prismatic)	1150	4.4	1
ICP553450SRMPA01+	Lithium ion (Prismatic)	1150	12	1
ICP553450SRMU+	Lithium ion (Prismatic)	1150	4.4	1
ICP553450SRMUPA01+	Lithium ion (Prismatic)	1150	12	1
ICP553450SRPA01+	Lithium ion (Prismatic)	1150	12	1
ICP554382WR+	Lithium ion (Prismatic)	2800	4.60	1
ICP554546SRMU+	Lithium ion (Prismatic)	1430	4.6	2, 4
ICP554546SRMUPA01+	Lithium ion (Prismatic)	1430	12	2, 4
ICP554546ZRU	Lithium ion (Prismatic)	1430	4.6	1
ICP554759AHRU	Lithium ion (Prismatic)	2040	4.6	1
ICP555148ZR+	Lithium ion (Prismatic)	1760	4.5	1
ICP555148ZRPA01+	Lithium ion (Prismatic)	1760	12	1
ICP555149ZRU+	Lithium ion (Prismatic)	1730	4.4	1
ICP555154ZR+	Lithium ion (Prismatic)	1930	4.5	1
ICP555172AHRU	Lithium ion (Prismatic)	2940	4.6	1
ICP563840SRU+	Lithium ion (Prismatic)	1020	4.4	1
ICP563840SRUPA01+	Lithium ion (Prismatic)	1020	12	1
ICP564296WR+	Lithium ion (Prismatic)	3220	4.6	1
ICP565156HR+	Lithium ion (Prismatic)	2100	4.5	1
ICP575154WR+	Lithium ion (Prismatic)	2200	4.6	1
ICP575673HR+	Lithium ion (Prismatic)	3100	4.5	1
ICP584638XRU+	Lithium ion (Prismatic)	1200	4.4	1

ICP584638XRUPA01+	Lithium ion (Prismatic)	1200	12	1
ICP595265ZR	Lithium ion (Prismatic)	2600	4.5	1
ICP595265ZR+	Lithium ion (Prismatic)	2600	4.5	1
ICP604261XS+	Lithium ion (Prismatic)	1880	4.5	1
ICP604462AHRU	Lithium ion (Pouch)	2420	4.6	1
ICP605148ZR	Lithium ion (Prismatic)	1890	4.5	1
ICP605148ZR+	Lithium ion (Prismatic)	1890	4.5	1
ICP633469WR+	Lithium ion (Prismatic)	2100	4.6	1
ICP643640SRU+	Lithium ion (Prismatic)	1100	4.4	1
ICP643640SRUPA01+	Lithium ion (Prismatic)	1100	12	1
ICP645466HR	Lithium ion (Prismatic)	3000	4.5	1
ICP652750SRU+	Lithium ion (Prismatic)	890	4.4	1
ICP652750SRU+ $$	Lithium ion (Prismatic)	890	4.4	1
ICP652750SRUPA01+	Lithium ion (Prismatic)	890	12	1
ICP652750SRUPA01+ $$	Lithium ion (Prismatic)	890	12	1
ICP652761SRU+	Lithium ion (Prismatic)	1100	4.4	1
ICP652761SRUPA01+	Lithium ion (Prismatic)	1100	12	1
ICP653039SR+	Lithium ion (Prismatic)	900	4.4	1
ICP653039SR+ $$	Lithium ion (Prismatic)	900	4.4	1
ICP653039SRPA01+	Lithium ion (Prismatic)	900	12	1
ICP653039SRPA01+ $$	Lithium ion (Prismatic)	900	12	1
ICP653039SRU+	Lithium ion (Prismatic)	900	4.4	1
ICP653039SRUPA01+	Lithium ion (Prismatic)	900	12	1
ICP653047AS+	Lithium ion (Prismatic)	1000	4.4	1
ICP653047ASPA01+	Lithium ion (Prismatic)	1000	12	1
ICP653438SRU+	Lithium ion (Prismatic)	1000	4.4	1
ICP653438SRUPA01+	Lithium ion (Prismatic)	1000	12	1
ICP653443AR+	Lithium ion (Prismatic)	1100	4.4	1
ICP653443AR+ $$	Lithium ion (Prismatic)	1100	4.4	1
ICP653443ARM+	Lithium ion (Prismatic)	1000	4.55	1
ICP653443ARM+ $$	Lithium ion (Prismatic)	1000	4.55	1
ICP653443ARMPA01+	Lithium ion (Prismatic)	1000	4.55	1
ICP653443ARMPA01+ $$	Lithium ion (Prismatic)	1000	4.55	1
ICP653443ARPA01+	Lithium ion (Prismatic)	1100	12	1
ICP653443ARPA01+ $$	Lithium ion (Prismatic)	1100	12	1
ICP653443SRM+	Lithium ion (Prismatic)	1140	4.6	1
ICP653443SRM+ $$	Lithium ion (Prismatic)	1140	4.6	1
ICP653443SRMPA01+	Lithium ion (Prismatic)	1140	12	1
ICP653443SRMPA01+ $$	Lithium ion (Prismatic)	1140	12	1
ICP653443SRMU+	Lithium ion (Prismatic)	1140	4.6	1
ICP653443SRMU+ $$	Lithium ion (Prismatic)	1140	4.6	1
ICP653443SRMUPA01+	Lithium ion (Prismatic)	1140	12	1
ICP653443SRMUPA01+ $$	Lithium ion (Prismatic)	1140	12	1
ICP653450AR+	Lithium ion (Prismatic)	1200	4.4	1
ICP653450AR+ $$	Lithium ion (Prismatic)	1200	4.4	1
ICP653450ARPA01+	Lithium ion (Prismatic)	1200	12	1
ICP653450ARPA01+ $$	Lithium ion (Prismatic)	1200	12	1

ICP653450SRM+	Lithium ion (Prismatic)	1270	4.4	1
ICP653450SRMPA01+	Lithium ion (Prismatic)	1270	12	1
ICP653840SRU+	Lithium ion (Prismatic)	1180	4.4	1
ICP653840SRUPA01+	Lithium ion (Prismatic)	1180	12	1
ICP653850SRG+	Lithium ion (Prismatic)	1320	4.4	1
ICP653850SRGU+	Lithium ion (Prismatic)	1320	4.4	1
ICP653850SRGUPA01+	Lithium ion (Prismatic)	1320	12	1
ICP653850SRU+	Lithium ion (Prismatic)	1450	4.4	1
ICP653850SRUPA01+	Lithium ion (Prismatic)	1450	12	1
ICP653850XRU+	Lithium ion (Prismatic)	1500	4.5	1
ICP653850XRU+ $$	Lithium ion (Prismatic)	1500	4.5	1
ICP653850XRUPA01+	Lithium ion (Prismatic)	1500	12	1
ICP653850XRUPA01+ $$	Lithium ion (Prismatic)	1500	12	1
ICP653859SR+	Lithium ion (Prismatic)	1600	4.4	1
ICP653865SRU+	Lithium ion (Prismatic)	1800	4.4	1
ICP654052SRU	Lithium ion (Prismatic)	1470	4.4	1
ICP674965AHRU*	Lithium ion (Prismatic)	2920	4.6	1
ICP704546HRU	Lithium ion (Prismatic)	1960	4.65	1
ICP704546SRMU+	Lithium ion (Prismatic)	1820	4.6	1
ICP704546SRMUPA01+	Lithium ion (Prismatic)	1820	12	1
ICP783640SR+	Lithium ion (Prismatic)	1340	4.4	1
ICP783640SRPA01+	Lithium ion (Prismatic)	1340	12	1
ICP803443AHRU	Lithium ion (Prismatic)	1530	4.62	1
ICP803443AR+	Lithium ion (Prismatic)	1350	4.4	1
ICP803443ARM+	Lithium ion (Prismatic)	1350	4.45	1
ICP803443ARMPA01+	Lithium ion (Prismatic)	1350	10	1
ICP803443ARPA01+	Lithium ion (Prismatic)	1350	12	1
ICP803443SRMU+	Lithium ion (Prismatic)	1380	4.6	1
ICP803443SRMUPA01+	Lithium ion (Prismatic)	1380	12	1
ICP993039SR+	Lithium ion (Prismatic)	1340	4.4	1
ICP993039SRPA01+	Lithium ion (Prismatic)	1340	12	1
ICR18650PA	Lithium ion (Cylindrical)	4000	4.5	1
ICR18650PD	Lithium ion (Cylindrical)	2300	4.35	1
IMR18650PA2	Lithium ion (Cylindrical)	4000	4.5	1
INR14400P	Lithium ion (Cylindrical)	1000	4.5	1
INR18650PB1	Lithium ion (Cylindrical)	4000	4.5	1
INR18650PB2	Lithium ion (Cylindrical)	4000	4.5	1
INR18650PB2G	Lithium ion (Cylindrical)	4000	4.5	1
INR18650PE2	Lithium ion (Cylindrical)	4000	4.35	1
ML1220(@)	Lithium ion (Coin)	300	5.0	1
ML2016*	Lithium ion (Coin)	100	12	3
ML2016H*	Lithium ion (Coin)	100	12	3
ML2032*	Lithium ion (Coin)	100	12	3

[a] These cells and batteries are not rechargeable. The circuit containing these cells or batteries is to contain a protective component that prevents charging. The circuitry is to include a current-limiting component intended to protect the cell or battery, in the event the protective component malfunctions, from a charging current in excess of the maximum abnormal charging current indicated.

[b] User - These primary cells and batteries are intended for use in applications subject to replacement by a user.

[c] Technician - These primary cells and batteries are intended for use in applications subject to replacement only by a trained service technician.

[d] These cells and batteries are rechargeable. The circuitry containing these cells or batteries is to contain protective components intended to protect the cells or batteries from currents in excess of the maximum charging current and voltage indicated.

[e] The Max Charging Voltage noted in the column is the maximum voltage employed during the abnormal charging test of the secondary lithium ion cell. However, the maximum recommended charging voltage for lithium ion cells is 4.2 V, unless indicated otherwise.

[f] Test Compliance - The cells comply with the tests in UL 1642 as noted:

1 - Complies with all single-cell tests

2 - Complies with all single-cell tests except the impact test

3 - Complies with all single-cell tests except the projectile test

4 - Complies with all single-cell tests except the crush test

$$ - Issued Date: 2002-08-14

* - These cells and batteries may come with an optional single or multiple alphanumeric denoting various pin, tab, cap or wire termination types.

+ - These models may come with an optional single or multiple alphanumeric suffix for internal use only.

@ - These cells may have various insulating tube, ring or tape.

Marking: Company name or tradename "HM" , "HMC" , "HML" , "MH12568" , "maxell" , Recognized Component Mark, on the cell or smallest shipping package containing the cell.

Last Updated on 2014-09-22

• 2014 UL LLC

When the UL Leaf Mark is on the product, or when the word "Environment" is included in the UL Mark, please search the UL Environment database for additional information regarding this product's certification.

The appearance of a company's name or product in this database does not in itself assure that products so identified have been manufactured under UL's Follow-Up Service. Only those products bearing the UL Mark should be considered to be Certified and covered under UL's Follow-Up Service. Always look for the Mark on the product.

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Pony Testing International Group

报告编号(Report ID): I12312260311D

海 运 By Sea

货物运输条件鉴定书

Certification for Safe Transport of Goods

非限制性货物

Non-restricted Goods

样品名称及型号 (Sample Description & Model)	锂-二氧化锰扣式电池 型号：CR2032H 3V 240mAh 锂含量 0.07g Li-MnO_2 Button Cell Model:CR2032H 3V 240mAh Lithium metal content 0.07g
委托单位 (Applicant)	日立麦克赛尔国际有限公司 Hitachi Maxell Global Ltd
生产单位 (Manufacturer)	日立麦克赛尔国际有限公司 Hitachi Maxell Global Ltd

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Pony Testing International Group
www.ponytest.com

No.: I12312260311D
Code: cmnjdb

Pony Testing International Group

货物运输条件鉴定书
Certification for Safe Transport of Goods

样品名称 Sample Description	锂-二氧化锰扣式电池 型号：CR2032H 3V 240mAh 锂含量 0.07g	
	Li-MnO_2 Button Cell Model:CR2032H 3V 240mAh Lithium metal content 0.07g	
委托单位 Applicant	日立麦克赛尔国际有限公司	
	Hitachi Maxell Global Ltd	
生产单位 Manufacturer	日立麦克赛尔国际有限公司	
	Hitachi Maxell Global Ltd	
检查方法、程序 Inspection method and procedure	《国际海运危险货物规则》(36-12) << International Maritime Dangerous Goods >>(36-12)	
样品信息 Sample information	电池种类/Battery type	一次性锂电池芯 Primary Li Cell
	型号规格/Model	CR2032H 3V 240mAh
	锂含量/lithium content	0.07g
	外观/Appearance	银色/Silver 19.84mm*3.04mm
	商标/trade mark	Maxell
包装件信息 Package information	尺寸/Size	360mm(L)*360mm(W)*290mm(H)
	包装件重量/Weigh	16.5kg
	电池个数/battery number	4000pcs
	放置方式/ Placement	只有电池/Battery only
鉴定结果 Identification conclusion	1.危险性识别(Hazard identification) 锂金属电池芯。 Lithium metal cell. 2. 按照《国际海运危险货物规则》办理类项（Suggestion according to IMDG） 按非限制性货物条件办理。 The goods are not subject to IMDG. 3.包装要求（Packaging requirements） 按非限制性货物包装要求办理。 The goods are packaged according to the packaging requirement of Non-restricted Goods.	
委托日期 Entrust date	2014 年 12 月 31 日	完成日期 Finished Date: 2015 年 1 月 8 日
备注 Comment	本报告当年有效。 The report is only valid in the year subscribed on it.	

主检人 (Prepared by)：刘春艳 审核人 (Checked by)：王丽锋 批准人 (Approved by)：苏凯

Pony Testing International Group

货物运输条件鉴定书

Certification for Safe Transport of Goods

序号 No.	检查结果 Inspection results
1	客户声明 Consignor announcement: a.本报告所述锂电池按照《危险品规则》2.9.4.5 规定的质量管理体系进行制造。 Lithium cells and batteries listed in this report were manufactured under the quality management programme as described in IMDG 2.9.4.5.
2	a.本报告所述锂电池已通过联合国《试验和标准手册》第III部分 38.3 小节相应测试要求。(报告编号：I01103066521D, I01103066521D~1) Lithium cells and batteries listed in this report are of the types proven to meet the requirement of each applicable test in the UN Manual of Tests and Criteria, Part III, sub-section 38.3. (Report No.: I01103066521D, I01103066521D~1) b. 包装件能够承受 1.2 米跌落试验。(报告编号：I01103073621D, I01103073621D~1) The package has passed the 1.2m drop test.(Report No.: I01103073621D, I01103073621D~1)
3	a.锂电池完全封装在内包装内，位于坚固的外包装中。 Lithium cells and batteries are packed in inner packagings that completely enclose the cell or battery and placed in a strong outer packaging.
4	a.电池具有适当的防短路措施。 Cells and batteries are properly protected to prevent short circuits.
5	a. 每个包装件须按以下要求进行标记，且须付以下内容的文件： i） 适当说明包装件含有锂金属电池芯 ii） 说明包件须轻拿轻放及如果损坏存在易燃危险 iii） 说明一旦包装件破损须遵循特殊的程序，包括必要的检查和重新包装 iv） 作为附件信息的电话 Each consignment must be marked and accompanied with a document with an indication that: i) The package contains lithium metal cells. ii) The package must be handled with care and that a flammability hazard exists if the package is Damaged. iii) Special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary. iv) A telephone number for additional information.
6	a.包装件总重不得超过 30kg。 Packages may not exceed 30kg gross mass.

Pony Testing International Group

样品图片(Sample photo) 1	样品图片(Sample photo) 2	样品图片(Sample photo) 3

样品图片(Sample photo) 4	样品图片(Sample photo) 5

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***报告结束 End of report ***

SGS

Test Report

No.HKHL1401001330JL Date: JAN 14, 2014

HITACHI MAXELL GLOBAL LTD
SUTIES 807-811, 8/F., SOUTH TOWER, WORLD FINANCE CENTRE,
HARBOUR CITY, 17 CANTON ROAD, TST, KOWLOON,
HONG KONG

The following samples were submitted and identified on behalf of the client as:
COIN-TYPE LITHIUM MANGANESE DIOXIDE BATTERY

SGS Case No.	:	HKHL131200087285
Brand Name	:	MAXELL
Model No.	:	CR2032H
MAS Ref.	:	C07
Sample Receiving Date	:	DEC 24, 2013
Test Performing Date	:	DEC 24, 2013 – JAN 07, 2014

Test Requested : Please refer to the result summary.

Test Method & Results : Please refer to next page(s).

Result Summary :

Test Requested	Conclusion
European Directive 2006/66/EC and its amendments – Lead, Cadmium and Mercury Content	PASS

Signed for and on behalf of
SGS Hong Kong Ltd.

Wu Chun Hang, Timothy
Assistant Technical Services
Manager

14. 1. 16

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested *and such sample(s) are retained for 30 days only.*

Test Results :

European Directive 2006/66/EC and its amendments – Lead, Cadmium and Mercury Content

Method : Acid digestion followed by Atomic Absorption Spectrometry analysis.

For button cells:

Test Item	Result (%)	Reporting Limit (%)	Labelling requirement (%)	Permissible Limit (%)
	1			
Lead (Pb)	ND	0.001	> 0.004	--
Cadmium (Cd)	ND	0.001	> 0.002	0.002
Mercury (Hg)	ND	0.0001	> 0.0005	2
Comment	PASS	--	--	--

Sample Description :
1. COIN-TYPE LITHIUM MANGANESE DIOXIDE BATTERY

Note : 1. % = percentage by weight
2. > = greater than
3. ND = Not Detected

14.1.16

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Flow chart

*** End of Report ***

14.1.16

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maxell

SAFETY DATA SHEETS
Based on 1910.1200 App D

The batteries are articles and are not subject to the OSHA Hazard Communication Standard Requirement as shown in paragraph (b)(6)(v) of §1910.1200. This sheet is provided as technical information only. The information and recommendations set forth are made in good faith and are believed to be accurate as of the date of preparation. However, **Maxell makes no warranty expressed or implied.**

1. Identification

(a) Product identifier used on the label:

CR/maxell/3V/+

(b) Other means of identification:

Lithium manganese dioxide battery

(c) Recommended use of the chemical and restrictions on use:

See **7.Handling and storage**

(d) Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party:

Manufacturer: Hitachi Maxell, Ltd.
Address: 5, Takumidai, Ono-shi, Hyogo 675-1322, Japan
Tel: +81-(0)794-63-8054
Fax: +81-(0)794-63-8058

(e) Emergency phone number.

Tel: +81-(0)794-63-8054

2. Hazard(s) identification

(a) Classification of the chemical in accordance with paragraph (d) of §1910.1200

Chemical battery (Primary)

(b) Signal word, hazard statement(s), symbol(s) and precautionary statement(s) in accordance with paragraph (f) of §1910.1200. (Hazard symbols may be provided as graphical reproductions in black and white or the name of the symbol, e.g., flame, skull and crossbones)

N/A

(c) Describe any hazards not otherwise classified that have been identified during the classification process

This contains lithium, organic solvent, and other combustible materials. For this reason, improper handling of the battery could lead to distortion, leakage*, overheating, explosion, or fire and cause human injury or equipment trouble. Please strictly observe safety instructions.

(* Leakage is defined as an unintended escape of liquid from a battery.)

(d) Where an ingredient with unknown acute toxicity is used in a mixture at a concentration ≥1% and the mixture is not classified based on testing of the mixture as a whole, a statement that X% of the mixture consists of ingredient(s) of unknown acute toxicity is required

No such an ingredient is contained in the product.

3. Composition/information on ingredients

Except as provided for in paragraph (i) of §1910.1200 on trade secrets:

For Substances:

(a) Chemical name

(b) Common name and synonyms

(c) CAS number and other unique identifiers

(d) Impurities and stabilizing additives which are themselves classified and which contribute to the classification of the substance

Chemical Name	Common Name and Synonyms	CAS #	Content (Wt %)
Manganese Dioxide	MnO_2	1313-13-9	15 to 40
Propylene Carbonate	$C_4H_6O_3$	108-32-7	2 to 6
1,2-Dimethoxyethane	$C_4H_{10}O2$	110-71-4	1 to 5
Lithium Perchlorate	$LiClO_4$	7791-03-9	0.1 to 1.5
Lithium or Lithium Alloy	Li	7439-93-2	1 to 5
Graphite	C	7782-42-5	1 to 4

Lithium content for each cell

Model	Li content (g)	Model	Li content (g)
CR1216	0.008	CR2016	0.03
CR1220	0.011	CR2025	0.05
CR1616	0.02	CR2032	0.07
CR1620	0.025	CR2032H	0.07
CR1632	0.04	CR2430	0.09
		CR2450	0.18

For Mixtures

In addition to the information required for substances:

(a) The chemical name and concentration (exact percentage) or concentration ranges of all ingredients which are classified as health hazards in accordance with paragraph (d) of §1910.1200 and

(1) Are present above their cut-off/concentration limits; or

(2) Present a health risk below the cut-off/concentration limits.

No such an ingredient is contained in the product.

(b) The concentration (exact percentage) shall be specified unless a trade secret claim is made in accordance with paragraph (i) of §1910.1200, when there is batch-to-batch variability in the production of a mixture, or for a group of substantially similar mixtures (See A.0.5.1.2) with similar chemical composition. In these cases, concentration ranges may be used.

No such a situation would happen during the production from batch to batch.

For All Chemicals Where a Trade Secret is claimed

Where a trade secret is claimed in accordance with paragraph (i) of §1910.1200, a statement that the specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret is required.

4. First-aid measures

(a) Description of necessary measures, subdivided according to the different routes of exposure, i.e., inhalation, skin and eye contact, and ingestion

Inhalation	Fumes can cause respiratory irritation. Remove to fresh air and consult a physician.
Skin Contact	Immediately flush skin with plenty of water. If itch or irritation by chemical burn persists, consult a physician.
Eye Contact	Immediately flush eye with plenty of water for at least 15 minutes. Consult a physician immediately
Ingestion	If swallowing a battery, consult a physician immediately. If contents come into mouth, immediately rinse by plenty of water and consult a physician.

(b) Most important symptoms/ effects, acute and delayed

NA.

(c) Indication of immediate medical attention and special treatment needed, if necessary

Wash with clean water immediately.

5. Fire-fighting measures

(a) Suitable (and unsuitable) extinguishing media.

Extinguisher of alkaline metal fire is effective. Plenty of cold water is also effective to cool the surrounding area and control the spread fire.

(b) Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products).

Hydrogen gas may be evolved by the reaction of water and lithium and it can form an explosive mixture. Therefore when lots of lithium batteries are burning in a confined space, use a smothering agent (ex. Carbon dioxide or dry sand).

(c) Special protective equipment and precautions for fire-fighters.

Use self-contained breathing apparatus and full protective gear not to inhale harmful gas.

6. Accidental release measures

(a) Personal precautions, protective equipment, and emergency procedures.

Wear protective clothing. Keep unprotected persons away.

(b) Methods and materials for containment and cleaning up.

When the liquid leaks out of the battery, absorb and wipe it with dry cloth.

Keep the battery away from fire or heat.

7. Handling and storage

(a) Precautions for safe handling.

● Never swallow.

If swallowed, see Section 4 - First Aid Measures.

● Never charge.

The battery is not designed to be charged by any other electrical source. Charging could generate gas and internal short-circuiting, leading to distortion, leakage, overheating, explosion, or fire.

● Never heat.

Heating the battery to more than 100 degree centigrade could increase the internal pressure, causing distortion, leakage, overheating, explosion, or fire.

● Never expose to open flames.

Exposing to flames could cause the lithium metal to melt, causing the battery to catch on

fire and explosion.

● Never disassemble the battery.

Do not disassemble the battery, because the separator or gasket could be damaged, leading to distortion, leakage, overheating, explosion or fire.

● Never reverse the positive and negative terminals when mounting.

Improper mounting of the battery could lead to short-circuiting, charging or forced-discharging. This could cause distortion, leakage, overheating, explosion, or fire.

● Never short-circuit the battery.

Do not allow the positive and negative terminals to short-circuit. Never carry or store the battery with metal objects such as a necklace or a hairpin. Do not take multiple batteries out of the package and pile or mix them when storing. Otherwise, this could lead to distortion, leakage, overheating, explosion, or fire.

● Never weld the terminals or weld a wire to the body of the battery directly.

The heat of welding or soldering could cause the lithium to melt, or cause damage to the insulating material in the battery. This could cause distortion, leakage, overheating, explosion, or fire.

● Never use different batteries together.

Using different batteries together, i.e. different type or used and new or different manufacturer could cause distortion, leakage, overheating, explosion, or fire because of the differences in battery property.

● Never allow liquid leaking from the battery to get in your eyes or mouth.

If the liquid comes into eyes, or mouth, see Section 4 - First Aid Measures.

●Keep leaking batteries away from fire.

If leakage is suspected or you detect a strong odor, keep the battery away from fire, because the leaked liquid could catch on fire.

● Never touch the battery electrodes.

Do not allow the battery electrodes to come in contact with your skin or fingers. Otherwise, the moisture from your skin could cause a discharge of the battery, which could produce certain chemical substances causing you to receive a chemical burns.

(b) Conditions for safe storage, including any incompatibilities.

Never let the battery contact with water. Never store the battery in hot and high humid place.

.

8. Exposure controls/personal protection

(a) OSHA permissible exposure limit (PEL), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV), and any other exposure limit

used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet, where available.

N/A

(b) Appropriate engineering controls.

Do not disassemble the product without professional basis.

(c) Individual protection measures, such as personal protective equipment.

No special equipment is required for handling, carrying or using the product.
The chemical materials concluded in the Product is sealed up, thus being stable, safe and eco-friendly under common conditions.

9. Physical and chemical properties

(a) Appearance (physical state, color, etc.)	:	The appearance is a coin shape and it is a primary cell with 3V nominal voltage.
(b) Odor	:	not applicable
(c) Odor threshold	:	not applicable
(d) pH	:	not applicable
(e) Melting point/ freezing point	:	not applicable
(f) Initial boiling point and boiling range	:	not applicable
(g) Flash point	:	not applicable
(h) Evaporation rate	:	not applicable
(i) Flammability (solid, gas)	:	not applicable
(j) Upper/lower flammability or explosive limits	:	not applicable
(k) Vapor pressure	:	not applicable
(l) Vapor density	:	not applicable
(m) Relative density	:	not applicable
(n) Solubility(ies)	:	not applicable
(o) Partition coefficient: n-octanol/ water	:	not applicable
(p) Auto-ignition temperature	:	not applicable

(q) Decomposition temperature : not applicable

(r) Viscosity : not applicable

10. Stability and reactivity

(a) Reactivity

N/A

(b) Chemical stability

Stable (performance deterioration depends on circumstance.)

(c) Possibility of hazardous reactions

No.

(d) Conditions to avoid (e.g., static discharge, shock, or vibration)

See **7.Handling and storage**

(e) Incompatible materials

Water

(f) Hazardous decomposition products

Hydrogen (By moisture).

11. Toxicological information

Description of the various toxicological (health) effects and the available data used to identify those effects, including

(a) Information on the likely routes of exposure (inhalation, ingestion, skin and eye contact)

As the contents are sealed in the battery case, there is no toxicity.

(b) Symptoms related to the physical, chemical and toxicological characteristics

People might feel itching, if the inner liquid splashes onto skin.

(c) Delayed and immediate effects and also chronic effects from short- and long-term exposure

N/A

(d) Numerical measures of toxicity (such as acute toxicity estimates)

N/A

(e) Whether the hazardous chemical is listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest edition), or by OSHA

No.

12. Ecological information (Non-mandatory)

(a) Ecotoxicity (aquatic and terrestrial, where available): N/A

(b) Persistence and degradability: N/A

(c) Bio-accumulative potential: N/A

(d) Mobility in soil: N/A

(e) Other adverse effects (such as hazardous to the ozone layer) : If the battery is disposed in land or water, battery case may be corroded and the liquid may leak out of the battery. Information regarding ecological concerns has not been reported.

13. Disposal considerations (Non-mandatory)

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging.

The battery may be regulated by national or local regulation. Please follow the instructions of proper regulation. As electric capacity is left in a discarded battery and it comes into contact with other metals, it could lead to distortion, leakage, overheating, or explosion, so make sure to cover the (+) and (-) terminals with friction tape or some other insulator before disposal.

14. Transport information (Non-mandatory)

1) Shipping Name (UN Number): Lithium metal batteries (UN3090)
Lithium metal batteries packed with equipment (UN3091)
Lithium metal batteries contained in equipment (UN3091)

2) Hazard Classification: Class 9 (Miscellaneous)

3) Method of transportation: As the cells are manufactured under a quality management programme in the ISO9001 certified factory and the cells meet all the requirements in UN manual of tests and criteria, Part III, sub-section 38.3, the applicable packing instructions (PI) or special provisions (SP) are as per the following table.

The cells or batteries classified in Section II of any Packing Instruction or SP188 may be exempted from Class 9 Dangerous Goods if complying with all requirements of applicable Section II or SP188. But Lithium metal cells and batteries transported as cargo are

restricted to Cargo Aircraft Only since January 1st 2015.

Note. The prohibition does not apply to lithium metal batteries packed with equipment (PI 969) or contained in equipment (PI 970).

Li content per cell	Product name	Air *See Section 15 4)			Sea *See Section 15 5)
		Cell only	Cell packed with equipment	Cell contained in equipment	
not more than 0.3 g	CR1216, CR1220, CR1616, CR1620, CR1632, CR2016, CR2025, CR2032, CR2032H, CR2430, CR2450	PI968 Section II	PI969 Section II	PI970 Section II	SP188
more than 0.3 g but not more than 1 g	(No)	PI968 Section IB (8 or less cells: Section II)	PI969 Section II	PI970 Section II	SP188
more than 1 g	(No)	PI968 Section IA	PI969 Section I	PI970 Section I	SP230

As the related district, country or airline may establish their special requirements, the shipper shall confirm them with the forwarder in advance.

Please confirm the aggregate lithium content when transport the battery.

(a) UN proper shipping name: Lithium metal batteries

(b) Packing group, if applicable: as table mentioned above

(c) Environmental hazards (e.g., Marine pollutant (Yes/No)) No.

(d) Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code)

N/A for Annex II of MARPOL 73/78 and the IBC Code.
The products can be transported if complying with ICAO Technical Instructions or IMDG-Code.

(e) Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises

Avoid high-temperature, high-humidity condition.

15. Regulatory information

Major applicable regulations for the transportation of lithium metal cells and batteries are as follows:

1) UN(United Nations) Recommendations on the Transport of Dangerous Goods: Model Regulations 18th revised edition

2) UN(United Nations) Recommendations on the Transport of Dangerous Goods: Manual of Test and Criteria 5th revised edition, Amendment 2

3) International Civil Aviation Organization (ICAO): Technical Instructions for Safety Transport of Dangerous Goods by Air, 2015-2016 Edition

4) International Air Transport Association (IATA): Dangerous Goods Regulations, 57th Edition

5) International Maritime Organization (IMO): International Maritime Dangerous Goods (IMDG) Code, 2014 Edition

Major environmental regulations are as follows:

1) EU BATTERY DIRECTIVE (2006/66/EC)

2) California Code of regulations, Title 22, Division 4.5, Chapter 33: Best Management Practices for Perchlorate Materials

16. Other information, including date of preparation or last revision

The date of preparation of the SDS or the last change to it

This Safety Date Sheets (SDS) is issued on 1 Jan, 2016 according to requirements of the USA's OSHA Standard 1910.1200 App D.

If you want further information, please contact Maxell sales representative.

DOCUMENT TITLE
Conflict Minerals Reporting Template
SHEET

REVISION HISTORY

A change in the first digit of the revision number (e.g., 1.0 to 2.0) signifies a set of major improvements have occurred which will likely include different data reporting requirements. Changes to the first or second decimal place (e.g., "2.01" to "2.02") indicate only minor changes have been made to the template which are not expected to result in substantial changes to the data being reported. The addition of a letter (e.g., "a", or "b", or "c") following the revision number indicate that only the standard smelter list has been updated from the prior version.

REVISION	ORIGINATOR	RELEASE DATE	DESCRIPTION OF FUNCTIONAL CHANGE	UPDATES TO SMELTER LIST
1	Jared Connors,	July 19th, 2011	New Release	
2	Jared Connors, Intel	Aug 29th, 2012	Major update to functionality including: addition of the known smelter list, addition of declaration scope including product tab, and added and modified multiple questions and / or their responses.	New.
2.01	Jared Connors, Intel	Dec 21st 2012	List of changes to the template functionality: 1. Modified Smelter List tab to prevent smelter rows from wrapping text. This was being caused by the hidden formula in column A which allows for a software vendor to easily grab the smelter IDs. 2. Changed protection settings on the Smelter List tab to allow users to delete rows. This allows users to delete rows with incorrect entries within the smelter tab. Ensured that columns could not be mistakenly deleted in the process.	1. Added "CV DS Jaya Abadi" an alias to "PT Starindo Inti Perkasa" 2. Added "Mentok" as an alias to "PT Tambang Timah" 3. Corrected spelling of "Daduosihan" id # 3CHN001 4. Corrected spelling of "Mitsubishi Materials Corporation" id # 1JPN039 5. Changed "Gejiu Non-ferrous" to its proper name "Gejiu Non-Ferrous Metal Processing Co. Ltd." 6. Changed "Mitsubishi Material" to its proper name "Mitsubishi Materials Corporation" 7. Changed "Nistar" to "Kemet Blue Powder" 8. Added "Nihon Material Co. LTD" as a gold refiner 9. Added "Aida Chemical Industries Co. Ltd." as a gold refiner 10. Added "Asaka Riken Co Ltd" as a gold refiner 11. Added "Kojima Chemical" as a gold refiner 12. Added "Sabin" as a gold refiner 13. Added "United Precious Metal Refining Inc." as a gold refiner 14. Added "Yokohama Metal Co Ltd" as a gold refiner 15. Added "CNMC (Guangxi) PGMA Co., Ltd." as a tin refiner 16. Added "Conghua Tantalum and Niobium Smeltry" as a tantalum refiner 17. Removed "Tantalite Resources" as a refinery 18. Added "Minmetals Ganzhou Tin Co. Ltd." as a tin refinery 19. Updated "ATI Metalworking Products" to its proper full name "ATI Tungsten Materials" 20. Updated "China Minmetals Corp." to its proper full name "China Minmetals Nonferrous Metals Co Ltd" 21. Removed "Ganzhou Huaxing Tungsten" as a smelter 22. Removed "Ganzhou Nonferrous Metals Smelting Co Ltd." as a smelter 23. Removed "Sichuan Metals & Materials Imp & Exp Co as a tungsten smelter 24. Added "Ganzhou Grand Sea W & Mo Group Co., Ltd." as a tungsten smelter 25. Added "Hunan Chenzhou Mining Group Co" as a tungsten smelter 26. Added "Japan New Metals Co Ltd" as a tungsten smelter 27. Added "Zhuzhou Cemented Carbide Group Co Ltd" as a tungsten smelter
2.02	Jared Connors, Intel	March 29th 2013	1. Added new selection to the metals dropdown lists of smelter list tab "Smelter not yet identified" 2. Moved "smelter not listed" to the bottom of each metals dropdown list 3. Fixed error in Checker sheet to eliminate display of text "one or more smelters have been added to smelter list" when rows are deleted 4. Rewrite of T&Cs 5. Adding Italian translation 6. Allow for deletion of rows in Smelter List tab 7. Removed hover over text in column C of Smelter List tab 8. Inserted additional rows for data entry on the Smelter List tab up to 2,500 rows 9. Made smelter ID numbers visible in Smelter List tab 10. Made template revision history tab visible 11. Removed language selection from individual tabs, all controlled on Declaration tab 12. Updated template to prevent users from adding tabs to the worksheet 13. Added statement at the top of the revision history tab clarifying purpose of .0x revision updates	1. Added the following aliases to Ohio Precious Metals "OPM Metals", "USPM", "United States Precious Metals" 2. Added "ALMT" as tungsten smelter 3. Added "Suzhou Xingrui Noble" as gold smelter 4. Added "Shangdong Zhaojin Group" as an alias of "Shandong Zhaojin Gold & Silver Refinery Co., Ltd" 5. Added "Shandong Zhaoyuan Gold Argentine refining company limited" as an alias of "Zhongyuan Gold Smelter of Zhongjin Gold Corporation" 6. Added "SEMPSA" as an alias for "SEMPSA Joyeria Plateria SA" 7. Added "Unicore Brazil Ltd" as an alias for "Unicore Brasil Ltda" 8. Added "Pan Pacific Copper Co., LTD." as a gold smelter 9. Added "White Solder Metalurgia" as a tin smelter 10. Added "JiuJiang JinXin Nonferrous Metals Co. Ltd." as a tantalum smelter 11. Corrected spelling of "jiujiang Tanbre" to "JiuJiang Tambre Co. Ltd." 12. Added Torecom as a gold smelter 15. Added "PT Tinindo Internusa" as alias of "PT Tirindo Inter Nusa" 16. Added "CV Jus Tindo" as alias of "CV JusTindo" 17. Added "PT Bellton Makmur Lestari" and "BML" as alias of "PT BillTin Makmur Lestari" 18. Added "Liuzhou China Tin Group Co., Ltd." as alias of "Liuzhou China Tin" 19. Added "PT Timah (Persero) TBk" and "Banka Tin" as alias of "PT Tambang Timah" 20. Added "Yun Nan Tin Co. LTD" as alias of "Yunnan Tin Company Limited" 21. Added "GEJIU ZILI MINING&SMELTING CO.,LTD." as alias of "Gejiu Zi-Li" 22. Added "Jiangxi Tungsten Co Ltd" as alias of "Jiangxi Tungsten Industry Group Co Ltd" 23. Added "Linwu Xianggui" as a tin smelter 24. Added "IMLI" and "Indra Eramulti Logam" as aliases of "PT Bukit Timah" 25. Added "CV Gita Pesona" as tin smelter 26. Added "PT Tommy Utama" as tin smelter 27. Added "PT Bangka Tin Industry" as tin smelter 28. Added "PT DS Jaya Abadi" as tin smelter 29. Added "PT Panca Mega" as tin smelter 30. Added "PT Seirama Tin investment" as tin smelter 31. Added "PT Karimun Mining" as tin smelter 32. Added "Cooper Santa" as tin smelter 33. Added "Daejin Indus Co. Ltd" as gold smelter 34. Added "DaeyongENC" as gold smelter 35. Added "Do Sung Corporation" as gold smelter 36. Added "Hwasung CJ Co. Ltd" as gold smelter 37. Added "Korea Metal" as gold smelter 38. Added "SAMWON METALS Corp." as gold smelter
2.03	Akimasa Yamakawa, JEITA / John Plyler, BlackBerry	July 12th 2013	1. Resolved Excel 2003 incompatibility with programming for multiple languages. 2. Minor corrections to row number references in the instructions. 3. Added translation on checker sheet for the Column Name "Hyperlink to Source" 4. Corrected Japanese translation of "authorized representative" and "representative" on Declaration worksheet. 5. Adjusted row spacing of misc cells to allow for different lengths of translated text and comments. 6. Removed the symbols for the metals on the standard smelter list (e.g., "Sn"). 7. Deleted text "If no for all metals, you are done with this survey." from question 1 on the Declaration worksheet.	1. Added "Fujian Jinxin Tungsten Co., Ltd." as tungsten refiner 2. Added "Dayu Weiliang Tungsten Co., Ltd." as tungsten refiner 3. Added "Xinhai Rendan Shaoguan Tungsten Co., Ltd." as tungsten refiner 4. Added "Hunan Chun-Chang Nonferrous Smelting & Concentrating Co., Ltd." as tungsten refiner 5. Added "Jiangxi Minmetals Gao'an Non-ferrous Metals Co., Ltd." as tungsten refiner 6. Corrected the spelling of "Alfydne" to "Alfdyne" 7. Corrected the spelling of "Alfydne Powder Technologies" to "Alfdyne Powder Technologies" 8. Corrected the spelling of "Korea Metal" to "Korea Metal Co. Ltd" 9. Added "LMS Brasil S.A." as tantalum smelter 10. Added "QuantumClean" as tantalum smelter 11. Added "Taki Chemicals" as tantalum smelter 12. Added "Tantalite Resources" as tantalum smelter 13. Corrected naming inconsistency of "Ohio Precious Metals LLC." on standard smelter list and alias table. 14. Corrected naming inconsistency of "The Refinery of Shandong Gold Mining Co., Ltd" on standard smelter list and alias table. 15. Added "Molycorp Silmet" as tantalum smelter 16. Added "King-Tan Tantalum Industry Ltd" as tantalum smelter 17. Added "CooperMetal" as an alias of "Coopersanta" 18. Corrected the spelling of "Malaysia Smelting Corp" to "Malaysia Smelting Corporation (MSC)" 19. Corrected the spelling of "Asahi Pretec Corp" to "Asahi Pretec Corporation" 20. Corrected the spelling of "Umicor Precious Metal Refining Inc." to "United Precious Metal Refining Inc." 21. Added "Fenix Metals" as tin smelter 22. Changed alias "Bangka Tin" from "PT Tambang Timah" to "PT Timah" 23. Added "Ketapang" as an alias of "PT Bangka Putra Karya" 24. Corrected the Smelter ID of Cooper Santa from "2IDN063" to "2BRA063" 25. Added "Kundur" as an alias of "PT Tambang Timah" 26. Added "TT" as an alias of "PT Tambang Timah" 27. Added "CooperMetal" as an alias of "Coopersanta" 28. Corrected spelling of "CV Prima Timah Utama" to "PT Prima Timah Utama".
2.03a	John Plyler, BlackBerry	July 25th 2013		1. Corrected the spelling of "ALMT" to "A.L.M.T. Corp." 2. Added "A.L.M.T. Tungsten Corp", "Allied Material Corp", and "ALMT" as aliases of "A.L.M.T. Corp." 3. Corrected country of "A.L.M.T. Corp." to "Japan" and smelter ID to "4JPN020" 4. Changed alias "Wolfram" for "Wolfram Company CJSC" to "Wolfram (Russia)" 5. Added "Wolfram (Austria)" as an alias of "Wolfram Bergbau und Hütten AG" 6. Added "Kennametal Inc." as a tungsten refiner 7. Added "kennametal" as an alias of "Kennametal Inc."
3.00	Akimasa Yamakawa, JEITA, and John Plyler, BlackBerry, under the direction of the CFSI Due Diligence Workgroup	April 9th 2014	Major update to synchronize the CFSI CMRT with the data fields in the newly published IPC-1755 Standard. Changes include: 1. Addition of new company information fields. 2. Two additional due diligence questions and removal of one. 3. Minor changes to question text throughout. 4. Expansion of instructions and definitions. 5. Updated translations of all modified text.	Added the following gold refiners: 1. Bauer Walser AG 2. C. Hafner GmbH + Co. KG 3. China National Gold Group Corporation 4. Colt Refining 5. Daye Non-Ferrous Metals Mining Ltd. 6. Doduco 7. Eco-System Recycling Co., Ltd. 8. Gansu Seemine Material Hi-Tech Co Ltd 9. Guangdong Jinding Gold Limited 10. Hanzhou Fuchunjiang Smeltlre Co., Ltd. 11. Hunan Chenzhou Mining Industry Group 12. Kennecott Utah Copper LLC 13. Lingbao Jinyuan Tonghui Refinery Co. Ltd. 14. Luoyang Zijin Yinhui Metal Smelt Co Ltd 15. Metalor Technologies (Singapore) Pte. Ltd. 16. Ohura Precious Metal Industry Co., Ltd 17. Penglai Penggang Gold Industry Co Ltd 18. So Accurate Group, Inc. 19. Tongling nonferrous Metals Group Co.,Ltd 20. Umicore Precious Metals Thailand 21. YAMAMOTO PRECIOUS METAL CO., LTD. 22. Yunnan Copper Industry Co Ltd Added the following tantalum smelters: 1. Changsha South Tantalum Niobium Co Ltd 2. Guangdong Zhiyuan New Material Co., Ltd. 3. Hengyang King Xing Lifeng New Materials Co., LTD 4. Metallurgical Products India (Pvt.) Ltd. 5. Mineração Taboca S.A. 6. Shanghai Jiangxi Metals Co. Ltd 7. Yichun Jin Yang Rare Metal Co., Ltd Added the following tin smelters: 1. China Rare Metal Materials Company 2. Estanho de Rondônia S.A. 3. Magnu's Minerais Metais e Ligas LTDA 4. O.M. Manufacturing (Thailand) Co., Ltd. 5. Rui Da Hung 6. Soft Metais Ltda. Added the following tungsten refiners: 1. Ganzhou Jiangwu Ferrotungsten Co., Ltd. 2. Jiangxi Gan Bei Tungsten Co., Ltd. 3. Jiangxi Richsea New Materials Co., Ltd. 4. Jiangxi Tonggu Non-ferrous Metallurgical & Chemical Co., Ltd. 5. Jiangxi Xinsheng Tungsten Industry Co., Ltd. 6. Jiangxi Yaosheng Tungsten Co., Ltd. 7. Malipo Haiyu Tungsten Co., Ltd. 8. Xiamen Tungsten (H.C.) Co., Ltd. Removed the following as gold refiners: 1. Central Bank of the DPR of Korea 2 Codelco 3. Suzhou Xingrui Noble Removed "Cannon & Scott" as a tantalum smelter Removed the following as tin smelters: 1. CV Duta Putra Bangka 2. CV Gita Pesona 3. CV JusTindo 4. CV Makmur Jaya 5. CV Nurjanah 6. Gold Bell Group 7. PT Alam Lestari Kencana 8. PT Babel Surya Alam Lestari 9. PT Bangka Kudai Tin 10. PT Banoka Timah Utama Sejahtera 11. PT BillTin Makmur Lestari 12. PT Fang Di MuTiNdo 13. PT HP Metals Indonesia 14. PT Koba Tin 15. PT Panca Mega 16. PT Seirama Tin Investment 17. PT Sumbar Jaya Indah 18. PT Timah Nusantara 19. PT Tommy Utama 20 PT Yinchendo Mining Industry Removed the following as tungsten refiners: 1. China Minmetals Nonferrous Metals Co Ltd 2. Ganzhou Grand Sea W & Mo Group Co Ltd Changed numerous Standard Smelter Names, including: 1. "Pan Pacific Copper Co. LTD" to "JX Nippon Mining & Metals Co., Ltd" 2. "Xstrata Canada Corporation" to "CCR Refinery – Glencore Canada Corporation" 3. "PT Refined Banka Tin" to "PT Refined Bangka Tin" 4. "ATI Tungsten Materials" to "Kennametal Huntsville" 5. "Jiangxi Rare Earth & Rare Metals Tungsten Group Corp" to "Ganzhou Non-ferrous Metals Smelting Co., Ltd." 6. "Kennametal Inc." to "Kennametal Fallon" 7. "Chaozhou Xianglu Tungsten Industry Co Ltd" to "Guangdong Xianglu Tungsten Industry Co., Ltd."
3.01	Akimasa Yamakawa, JEITA, and John Plyler, BlackBerry, under the direction of the CFSI Due Diligence Workgroup		1. Removed the ability to overwrite the "Declaration Scope or Class" field. Users are restricted to only use the drop-down options. 2. Addressed issue with Checker incorrectly showing "Description of Scope" as missing data when a user selects "B. Product (or List of Products)" as the Declaration Scope. 3. Programmed Checker to show missing data when response to question B is "Yes", unless a url is entered the corresponding "Comments" field.	1. Added the tin smelter "Melt Metais e Ligas S/A" 2. Added the tungsten refiner "Vietnam Youngsun Tungsten Industry Co., Ltd" 3. Corrected the name of tin smelter "Liuzhou China Tin" to "China Tin Group Co., Ltd." 4. Corrected the name of tin smelter "PT Timah" to "PT Timah (Persero), Tbk"

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CFSI website: (www.conflictfreesourcing.org)
Training and guidance, template, Conflict-Free Smelter Program compliant smelter list

Introduction

This Conflict Minerals Reporting Template (Template) is a free, standardized reporting template created by the Electronic Industry Citizenship Coalition® (EICC®) and the Global e-Sustainability Initiative (GeSI). The Template facilitates the transfer of information through the supply chain regarding mineral country of origin and smelters and refiners being utilized and supports compliance to legislation*. The template also facilitates the identification of new smelters and refiners to potentially undergo an audit via the Conflict-Free Smelter Program**.

* In 2010, the U.S. Dodd-Frank Wall Street Reform and Consumer Protection Act was passed concerning "conflict minerals" originating from the Democratic Republic of the Congo (DRC) or adjoining countries. The SEC published final rules associated with the disclosure of the source of conflict minerals by U.S. publicly traded companies (see the rules at http://www.sec.gov/rules/final/2012/34-67716.pdf). The rules reference the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas, (http://www.oecd.org/daf/inv/mne/GuidanceEdition2.pdf), which guides suppliers to establish policies, due diligence frameworks and management systems.
** See information on the Conflict-Free Sourcing Initiative (www.conflictfreesourcing.org).

Instructions for completing Company Information questions (rows 8 - 22).
Provide comments in ENGLISH only

Note: Entries with (*) are mandatory fields.

1. Insert your company's Legal Name. Please do not use abbreviations

2. Select your company's Declaration Scope. The options for scope are:

A. Company-wide
B. Product (or List of Products)
C. User-Defined

For "Company-wide", the declaration encompasses the entirety of a company's products or product substances produced by the parent company.

For Scope selection of Product (or List of Products), a link to the worksheet tab for Product List will be displayed. If this scope is chosen, it is mandatory to list the Manufacturer's Product Number of the products covered under the Scope of this Declaration in Column B of the Product List worksheet. It is optional to list the Manufacturer's Product Name in Column C of the Product List worksheet.

For Scope selection of "User Defined", it is mandatory that the user describes the scope to which the conflict metals disclosure is applicable. The scope of this class shall be defined in a text field by the supplier and should be easily understood by customers or the receivers of the document. As an example, companies may provide a link to clarifying information.

This field is mandatory.

3. Insert your company's unique identifier number or code (DUNS number, VAT number, customer-specific identifier, etc.)

4. Insert the source for the unique identifier number or code ("DUNS", "VAT", "Customer", etc).

5. Insert your full company address (street, city, state, country, postal code). This field is optional.

6. Insert the name of the person to contact regarding the contents of the declaration information. This field is mandatory.

7. Insert the email address of the contact person. If an email address is not available, state ''not available'' or '' n/a.'' A blank field may cause an error in form implementation. This field is mandatory.

8. Insert the telephone number for the contact. This field is mandatory.

9. Insert the name of the person who is responsible for the contents of the declaration information. The authorizer may be a different individual than the contact person. It is not correct to use the words ''same'' or similar identification to provide the name of the authorizer. This field is mandatory.

10. Insert the title for the Authorizing person. This field is optional.

11. Insert the telephone number for the Authorizing person. This field is mandatory.

12. Insert the email address of the Authorizing person. If an email address is not available, state ''not available'' or ''n/a.'' A blank field may cause an error in form implementation. This field is mandatory.

13. Please enter the Date of Completion for this form using the format DD-MMM-YYYY. This field is mandatory.

14. As an example, the user may save the file name as: companyname-date.xls (date as YYYY-MM-DD).

Instructions for completing the seven Due Diligence Questions (rows 24 - 65).
Provide answers in ENGLISH only

These seven questions define the usage, origination and sourcing identification for each of the metals. Responses to these questions shall represent the 'Declaration Scope' selected in the company information section.

For each of the seven required questions, provide an answer for each metal using the pull down menu selections.

1. This is a declaration of whether or not conflict metals are intentionally added to your product by your company or your supply chain. This question shall be answered for each conflict metal. Valid responses to this question are either "Yes" or "No". This question is mandatory.

Some companies may require substantiation for a "No" answer that should be entered into the Comment Field.

2. This is a declaration that conflict metals are necessary to the production of your company's products and are contained in the finished product that your company manufactures or contracts to manufacture. The answer to this query shall be "Yes" or "No". This question is mandatory.

NOTE: The conflict mineral must be contained in the finished product to be applicable.

3. This is a declaration that any portion of the conflict metals contained in a product or multiple products originates from the DRC or an adjoining country (covered countries). The answer to this query shall be "Yes", "No", or "Unknown".

This question is mandatory for a specific metal if the response to Question 1 or 2 is "Yes" for that metal.

NOTE: If the answer to Question 5 is not "Yes, 100%" AND the answer to Question 6 is not "Yes" for the conflict metal, the answer to Question 3 should not be "No".

4. This is a declaration that identifies whether conflict metals contained in the product(s) necessary to the functionality of that product(s) originate from recycled or scrap sources. The answer to this query shall be "Yes", "No", or "Unknown". A "Yes" answer means that 100% of the conflict metal comes from recycled or scrap sources. A "No" answer means that some of the conflict metal does not come from recycled or scrap sources. An "Unknown" answer means that the user does not know whether or not 100% of the conflict metal comes from recycled or scrap sources. This question is mandatory for a specific metal if the response to Question 1 or 2 is "Yes" for that metal.

5. This is a declaration to determine whether a company has received conflict metals disclosures from all direct suppliers reasonably believed to be providing conflict minerals contained in the products covered by the scope of this declaration. The answers to this query shall be:

- Yes, 100%
- No, but greater than 75%
- No, but greater than 50%
- No, but greater than 25%
- No, but less than 25%
- None

This question is mandatory for a specific metal if the response to Question 1 or 2 is "Yes" for that metal.

6. This query verifies if the supplier has reason to believe they have identified all of the smelters providing conflict metals in the products covered by this declaration. The answer to this query shall be "Yes" or "No" along with a comment in certain cases, e.g. list of smelters. This question is mandatory for a specific metal if the response to Question 1 or 2 is "Yes" for that metal.

7. This query verifies that all of the smelters identified to be providing any of the conflict metals contained in the products covered by the scope of this declaration have been reported in this declaration. The answer to this query shall be "Yes", "No", or "Unknown". If any smelters or alleged smelters declared by your supply chain have not been included in this declaration, the appropriate answer is "No". The user may use the Comment Box to explain the reasons for non-inclusion if necessary.

This question is mandatory for a specific metal if the response to Question 1 or 2 is "Yes" for that metal.

Provide comments in the Comment sections as required to clarify your responses.

Instructions for completing Questions A. – J. (rows 69 - 87). Questions A. through J. are mandatory if the response to Question 1 or 2 is "Yes" for any metal.
Provide answers in ENGLISH only

The OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-affected and High-risk Areas (OECD Guidance) defines "Due Diligence" as "an on-going, proactive and reactive process through which companies can ensure that they respect human rights and do not contribute to conflict". Due diligence should be an integral part of your company's overall conflict free sourcing strategy. Questions A. thru J. are designed to assess your company's conflict-free minerals sourcing due diligence activities. Responses to these questions shall represent the full scope of your company's activities and shall not be limited to the 'Declaration Scope' selected in the company information section.

A. Please answer "Yes" or "No". Provide any comments, if necessary.

B. Please answer "Yes" or "No" If "Yes", provide the web link in the comments section.

C. Please answer "Yes" or "No". Provide any comments if necessary. See Definitions worksheet for definition of "DRC conflict -free".

D. Please answer "Yes" if your company requires your direct suppliers to source conflict minerals from validated, conflict free smelters by an independent private sector audit firm. Answer "No" if you do not require this of your direct suppliers.

E. Please answer "Yes" or "No" to disclose whether your company has implemented conflict minerals sourcing due diligence measures. This declaration is not intended to provide the details of a company's due diligence measures - just that a company has implemented due diligence measures. The aspects of acceptable due diligence measures shall be determined by the requestor and supplier.

Examples of due diligence measures may include: communicating and incorporating into contracts (where possible) your expectations to suppliers on conflict-free mineral supply chain; identifying and assessing risks in the supply chain; designing and implementing a strategy to respond to identified risks; verifying your direct supplier's compliance to its DRC conflict-free policy, etc. These due diligence measure examples are consistent with the guidelines included in the internationally recognized OECD Guidance.

F. Please answer "Yes" or "No". If you use the CFSI CMRT form or another format that conforms with the IPC-1755 standard, please answer "Yes". If you use a format that doesn't conform with the IPC-1755 standard, please answer "No", and describe what you request your suppliers to complete (e.g., certificate of compliance, custom form, etc.) in the comment field.

G. Please answer "Yes" or "No". Provide any comments, if necessary.

H. Please answer "Yes" or "No". In the comments section, you can provide additional information on your approach. Examples could be:

"3rd party audit" - on-site audits of your suppliers conducted by independent third parties.
"Documentation review only" - a reviewof supplier submitted records and documentation conducted by independent third parties and, or your company personnel.
"Internal audit" - on-site audits of your suppliers conducted by your company personnel.

I. Please answer "Yes" or "No". If "Yes", please describe how you manage your corrective action process.

J. Please answer "Yes" or "No". The SEC conflict minerals disclosure requirements apply to US exchange-traded companies that are subject to the US Securities Exchange Act. For more information please refer to www.sec.gov.

Instructions for completing the Smelter List Tab.
Provide answers in ENGLISH only

Note: Columns with (*) are mandatory fields

This template allows for smelter identification using the Smelter Reference List. Columns B,C,D and E must be completed in order from left to right to utilize the Smelter Reference List feature.
Use a separate line for each metal/smelter/country combination

1. Metal (*) - Use the pull down menu to select the metal for which you are entering smelter information. This field is mandatory.

2. Smelter Reference List(*) - Select from dropdown. This is the list of known smelters as of template release date. If smelter is not listed select 'Smelter Not Listed'. This will allow you to enter the name of the smelter in Column D. If you have not yet identified any smelters for a particular metal, you may select "Smelter not yet identified". This field is mandatory.

3. Smelter Name (*)- Fill in smelter name if you selected "Smelter Not Listed" in column C. This field will auto-populate when a smelter name in selected in Column C. This field is mandatory.

4. Smelter Country (*) – This field will auto-populate when a smelter name is selected in column C. If you selected "Smelter Not Listed" in column C, use the pull down menu to select the country location of the smelter. This field is mandatory.

5. Smelter Identification - This is a unique identifier assigned to a smelter or refiner according to an established smelter and refinery identification system. It is expected that multiple names or aliases could be used to describe a single smelter or refiner and therefore multiple names or aliases could be associated to a single 'Smelter ID'.

6. Source of Smelter Identification Number - This is the source of the Smelter Identification Number entered in Column F. If a smelter name was selected in Column C using the dropdown box, this field will auto-populate.

7. Smelter Street – Fill in the street address of the smelter that processes the minerals that enter your supply chain.

8. Smelter City – Fill in the city location of the smelter that processes the minerals that enter your supply chain.

9. Smelter Location: State/Province, if applicable – Fill in the state or province location of the smelter that processes the minerals that enter your supply chain.

10. Smelter Contact Name – The Conflict Minerals Reporting Template (CMRT) is circulated among companies in the requesting company's supply chain to ensure compliance with the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas and the U.S. Securities and Exchange Commission Final Rule on conflict minerals.

If the template is circulated in a country where laws protecting personal information exist, sharing personal contact information in the CMRT may violate related regulations. Therefore, it is recommended that the requesting company take precautions such as obtaining the contact person's permission to share the information with other companies in the supply chain when completing "Smelter Contact Name" and the "Smelter Contact Email" columns.

If you have permission to share this information, please fill in the name of the Smelter Facility Contact person who you worked with.

11. Smelter Contact Email – Fill in the email address of the Smelter Facility contact person who was identified as the Smelter Contact Name. Example: John.Smith@SmelterXXX.com. Please review the instructions for Smelter Contact Name before completing this field.

12. Proposed next steps - This is a comments area, which allows the company to specify the next steps to manage smelters. These are the actions you may take with the smelter if the facility is not listed on the CFSI Conflict-Free Smelter Program (CFSP) Compliant Smelter List. Example: request smelter facility to be assessed through the CFSP, remove from preferred supplier list, etc.

13. Name of Mine(s) - This field allows a company to define the actual mines being used by the smelter. Please enter the actual mine names if known. If 100% of the smelter's feedstock originates from recycled or scrap sources, enter "Recycled" or "Scrap" in place of the name of the mine and answer "Yes" in Column P.

14. Location (Country) of Mine(s) - This is a free form text field that allows a company to define the location of the mines being used by the smelter. Please enter the country of the mine(s). If the country of origin is not known, enter "Unknown". If 100% of the smelter's feedstock originates from recycled or scrap sources, enter "Recycled" or "Scrap" in place of the country of origin. This field is optional.

15. Does 100% of the smelter's feedstock originate from recycled or scrap sources? - Please answer "Yes" if the smelter solely obtains inputs for its smelting process(es) from recycled or scrap sources. Answer "No" otherwise.

16. Comments – free form text field to enter any comments concerning the smelter. Example: smelter is being acquired by Company YYY

The Checker worksheet is used to verify if all the required information in the Template has been completed. It is updated real-time and can be reviewed at any time while using the Template. It is used to verify completion.

To use this sheet, verify if all required fields have been completed (completed fields will be highlighted in green). If not, look for the red field(s) and review the "Notes" in Column C for required actions. You may use the URL in Column D to directly access the field for completion.

TERMS AND CONDITIONS

The Conflict-Free Smelter Program ("Program") Compliant Smelter List (the "List") and Program templates and tools, including, without limitation, the Conflict Minerals Reporting Template (collectively "Tools"), including, without limitation, all information provided therein, are provided for informational purposes only and are current as of the date set forth therein. Any inaccuracy or omission in the List or any Tool is not the responsibility of the Electronic Industry Citizenship Coalition, Incorporated, a Delaware non-stock corporation ("EICC"), or of the Global e-Sustainability Initiative, a Belgian international not-for-profit association ("GeSI"). Determination of whether and/or how to use all or any portion of the List or any Tool is to be made in the User's sole and absolute discretion. Prior to using the List or any Tool, you should review it with your own legal counsel. No part of the List or any Tool constitutes legal advice. Use of the List or any Tool is voluntary.

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If any part of any provision of these Terms and Conditions shall be invalid or unenforceable under applicable law, said part shall be deemed ineffective to the extent of such invalidity or unenforceability only, without in any way affecting the remaining parts of said provision or the remaining provisions of these Terms and Conditions.

By accessing and using the List or any Tool, and in consideration thereof, the User agrees to the foregoing.

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Return to declaration tab

Revision 3.01 May 30, 2014

ITEM	DEFINITION
3TG	Tantalum, tin, tungsten, gold
Authorizer	This field identifies the person responsible for the content of the declaration. The authorizer may be a different individual from the contact person. It is not correct to use the words "same" or similar identification to provide the name of the authorizer.
CFSP Compliant Smelter List	The Conflict- Free Smelter Program (CFSP) Compliant Smelter List is a published list of smelters and refiners that have undergone assessment through the CFSP, a program of the Conflict-Free Sourcing Initiative (CFSI) or industry equivalent program (such as Responsible Jewellery Council or London Bullion Market Association) and have been validated to be in compliance with the protocols. If a smelter or refiner is not on the list, it has either not completed a CFSP assessment or is not in compliance with the CFSP protocol.
Conflict-Free Smelter Program (CFSP)	The Conflict-Free Smelter Program (CFSP) is a program developed by the EICC and GeSI to enhance company capability to verify the responsible sourcing of metals. Further details of the CFSP can be found here: http://www.conflictfreesourcing.org/conflict-free-smelter-program/.
Conflict-Free Sourcing Initiative	Founded in 2008 by members of the Electronic Industry Citizenship Coalition and the Global e-Sustainability Initiative, the Conflict-Free Sourcing Initiative has grown into one of the most utilized and respected resources for companies addressing conflict minerals issues in their supply chains. Over 150 companies from seven different industries participate in the CFSI today, contributing to a range of tools and resources including the Conflict-Free Smelter Program, the Conflict Minerals Reporting Template, Reasonable Country of Origin Inquiry data and a range of guidance documents on conflict minerals sourcing. The CFSI also runs regular workshops on conflict minerals issues and contributes to policy development and debates with leading civil society organizations and governments. Additional information is available at http://www.conflictfreesourcing.org
Conflict Metal	Conflict metals are the metals derived from conflict minerals.
Conflict Mineral	As defined in 2010 United States legislation, Dodd-Frank Wall Street Reform and Consumer Protection Act, Section 1502(e)(4): CONFLICT MINERAL.—The term "conflict mineral" means— (A) columbite-tantalite (coltan), cassiterite, gold, wolframite, or their derivatives; or (B) any other mineral or its derivatives determined by the Secretary of State to be financing conflict in the Democratic Republic of the Congo or an adjoining country. (available at http://www.sec.gov/about/laws/wallstreetreform-cpa.pdf)
Covered Country(ies)	Covered Country(ies) as defined by the United States Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010. These countries include the Democratic Republic of the Congo and the nine countries with which it shares an internationally recognized border: Angola, Burundi, Central African Republic, Republic of the Congo, Rwanda, South Sudan, Tanzania, Uganda,
Declaration Scope or Class	For the purposes of this template, "scope" describes the applicability of the information provided by the reporting company. The scope may encompass the entirety of a company's services and/or products, or at a company's discretion, the template may be used to report on a specific product (or products), or, be 'User defined'. The 'User defined' scope selection or class may be used to describe any subset of a company's operation or product portfolio.
Dodd-Frank	2010 United States legislation, Dodd-Frank Wall Street Reform and Consumer Protection Act, Section 1502 ("Dodd-Frank") (http://www.sec.gov/about/laws/wallstreetreform-cpa.pdf)
DRC	Democratic Republic of Congo
DRC conflict-free	Products that do not contain minerals that directly or indirectly finance or benefit armed groups in the Democratic Republic of the Congo or an adjoining country. Source: 2010 United States legislation, Dodd-Frank Wall Street Reform and Consumer Protection Act, Section 1502 (http://www.sec.gov/about/laws/wallstreetreform-cpa.pdf)
EICC	Electronic Industry Citizenship Coalition (www.eicc.info)
GeSI	Global e-Sustainability Initiative (www.gesi.org)
Gold (Au) refiner (smelter)	A gold refiner is a metallurgical operation that produces fine gold with a concentration of 99.5% or higher from gold and gold-bearing materials with lower concentrations. Refer to the CFSP audit protocol for this metal for a complete description: http://www.conflictfreesourcing.org/audit-protocols-procedures/.
Independent Private Sector Audit Firm	With respect to smelter audits, an "Independent Private Sector Audit Firm", also known as an "Independent third-party audit firm" is a private sector organization competent in evaluating the smelter or refiner's materials traceability against the standards of the CFSP or equivalent audit protocols. To maintain neutrality and impartiality, such organization and its audit team members must have no conflicts of interest with the auditee.
Intentionally added	Intentionally added is commonly known as the deliberate use of a substance, or in this case metal, in the formulation of a product where continued presence is desired to provide a specific characteristic, appearance or quality. While the SEC does not define the phrase "intentionally added" in the final rule*, the rule's preamble states: "[W]e agree that being intentionally added, rather than being a naturally-occurring by-product, is a significant factor in determining whether a conflict mineral is "necessary to the functionality or production" of a product. This is true regardless of who intentionally added the conflict mineral to the product so long as it is contained in the product. [D]etermining whether a conflict mineral is considered "necessary" to a product should not depend on whether the conflict mineral is added directly to the product by the issuer or whether it is added to a component of the product that the issuer receives from a third party. Instead, the issuer should 'report on the totality of the product and work with suppliers to comply with the requirements.' Therefore, in determining whether a conflict mineral is "necessary" to a product, an issuer must consider any conflict mineral contained in its product, even if that conflict mineral is only in the product because it was included as part of a component of the product that was manufactured originally by a third party." *(56296 Federal Register / Vol. 77, No. 177 / Wednesday, September 12, 2012 / Rules and Regulations)
IPC	IPC (www.IPC.org) is a global industry association based in Bannockburn, Ill., dedicated to the competitive excellence and financial success of its 3,400 member companies which represent all facets of the electronics industry, including design, printed board manufacturing, electronics assembly and test. As a member-driven organization and leading source for industry standards, training, market research and public policy advocacy, IPC supports programs to meet the needs of an estimated $2.0 trillion global electronics industry. IPC maintains additional offices in Taos, N.M.; Washington, D.C.; Stockholm, Sweden; Moscow, Russia; Bangalore, India; Bangkok, Thailand; and Shanghai, Shenzhen, Chengdu, Suzhou and Beijing, China.
IPC-1755 Conflict Minerals Data Exchange Standard	This IPC standard establishes the requirements for exchanging conflict minerals data between suppliers and their customers. To meet the needs of a broad range of users, this standard provides flexibility in the scope of the products covered within a single declaration. This standard is not a compliance guide.
Necessary for the Functionality of a Product	The SEC does not provide a formal definition of this phrase in the final rule*, however it provides some guidance: A conflict mineral will be considered to be necessary to its functionality of a product if it meets the following: 1) is intentionally added to the product or any component of the product and is not a naturally-occurring byproduct; 2) is necessary to the product's generally expected function, use or purpose; and 3) is incorporated for the purpose of ornamentation, decoration, or embellishment, whether the primary purpose of the product is ornamentation or decoration. NOTE: The conflict mineral must be contained in the product to be applicable. *(56296 Federal Register / Vol. 77, No. 177 / Wednesday, September 12, 2012 / Rules and Regulations)
Necessary for the Production of a Product	The SEC does not provide a formal definition of this phrase in the final rule*; however, it provides some guidance: A conflict mineral will be considered to be necessary to the production of a product when: 1) it is intentionally included in the product's production process, other than if it is included in a tool, machine, or equipment used to produce the product (such as computers or power lines); 2) it is included in the product (MUST be contained in the product to be applicable); and 3) it is necessary to the product. *(56296 Federal Register / Vol. 77, No. 177 / Wednesday, September 12, 2012 / Rules and Regulations)
OECD	Organisation for Economic Co-operation and Development
Product	A company's Product or Finished good is a material or item which has completed the final stage of manufacturing and/or processing and is available for distribution or sale to customers.
Recycled or Scrap Sources	Recycled or scrap sources are recycled metals, that are reclaimed end-user or post-consumer products, or scrap processed metals created during product manufacturing. Recycled metal includes excess, obsolete, defective, and scrap metal materials that contain refined or processed metals that are appropriate to recycle in the production of tin, tantalum, tungsten and/or gold. Minerals partially processed, unprocessed or byproducts from other ores are not included in the definition of recycled metal.
SEC	U.S. Securities and Exchange Commission (www.sec.gov)
Smelter	A smelter or refiner is a company that procures and processes mineral ore, slag and/or materials from recycled or scrap sources into refined metal or metal containing intermediate products. The output can be pure (99.5% or greater) metals, powders, ingots, bars, grains, oxides or salts. The terms "smelter" and "refiner" are used interchangeably throughout various publications.
Smelter Identification Number	A unique identification number the CFSI assigns to companies that have been reported by members of the supply chain as smelters or refiners, whether or not they have been verified to meet the characteristics of smelters or refiners as defined in the CFSP audit protocols.
Tantalum (Ta) smelter	A tantalum smelter (also known as a processor) is defined as a company that converts Ta-containing ores, concentrates, slags or secondary materials into tantalum intermediate products or other tantalum containing products for direct sales or further processing into Ta-containing products, such as Ta powders, Ta components, Ta oxides, alloys, wires, sintered bars, etc. Refer to the CFSP audit protocol for this metal for a complete description at: http://www.conflictfreesourcing.org/audit-protocols-procedures/.
Tin (Sn) smelter	Primary [tin] smelters are companies with one or more facilities treating tin containing ore concentrates in order to produce tin metal. Secondary [tin] smelters are companies with one or more facilities that treat secondary materials by reduction for the production of crude or higher grade tin or tin product such as solder. A smelter as referred to within this audit protocol may operate as either one or both types of business operation. Refer to the CFSP audit protocol for this metal for a complete description: http://www.conflictfreesourcing.org/audit-protocols-
Tungsten (W) smelter	A company with one or more facilities that converts W-containing ores (such as wolframite and scheelite), W concentrates, or W-bearing scrap (secondary material) into tungsten containing intermediates such as Ammonium Para-Tungstate (APT), Ammonium Meta-Tungstate (AMT), ferrotungsten, and tungsten oxides for direct sales or further processed into W-containing products (such as W powder or W-carbide powder). Refer to the CFSP audit protocol for this metal for a complete description: http://www.conflictfreesourcing.org/audit-protocols-procedures/.

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Conflict Minerals Reporting Template (CMRT)

An initiative of the EICC and GeSI

Select Language Preference Here:
请选择你的语言:
사용할 언어를 선택하시오 :
表示言語をここから選択してください:
Sélectionner la langue préférée ici:
Selecione Preferência de idioma Aqui:
Wählen sie hier die Sprache:
Seleccione el lenguaje de preferencia aqui:
Selezionare la lingua di preferenza qui:

English

Click here to check required fields completion

Revision 3.01
May 30, 2014

The purpose of this document is to collect sourcing information on tin, tantalum, tungsten and gold used in products

Link to Terms & Conditions

Mandatory fields are noted with an asterisk (*). The information collected in this template should be updated annually. Any changes within the annual cycle should be provided to your customers

Company Information

Company Name (*):	Hitachi Maxell, Ltd.
Declaration Scope or Class (*):	B. Product (or List of Products)
Go to Product List tab to enter products this declaration applies to	Click here to enter the products this declaration applies to
Company Unique ID:	
Company Unique ID Authority:	
Address:	2-18-2, Iidabashi, Chiyoda-ku, Tokyo Japan
Contact Name (*):	Takayuki Nishi
Email – Contact (*):	takayuki-nishi@maxell.co.jp
Phone – Contact (*):	+81-794-63-8054
Authorizer (*):	Kenichi Sano
Title - Authorizer:	General Manager
Email - Authorizer (*):	kenichi-sano@maxell.co.jp
Phone - Authorizer (*):	+81-794-63-8054
Effective Date (*):	1-Apr-2015

Answer the following questions 1 - 7 based on the declaration scope indicated above

1) Is the conflict metal intentionally added to your product? (*)	Answer	Comments
Tantalum (*)	No	
Tin (*)	No	
Gold (*)	No	
Tungsten (*)	No	

2) Is the conflict metal necessary to the production of your company's products and contained in the finished product that your company manufactures or contracts to manufacture? (*)	Answer	Comments
Tantalum (*)	No	
Tin (*)	No	
Gold (*)	No	
Tungsten (*)	No	

3) Does any of the conflict metal originate from the covered countries? (*)	Answer	Comments
Tantalum		
Tin		
Gold		
Tungsten		

4) Does 100 percent of the conflict metal (necessary to the functionality or production of your products) originate from recycled or scrap sources? (*)	Answer	Comments
Tantalum		
Tin		
Gold		
Tungsten		

5) Have you received conflict metals data/information for each metal from all relevant suppliers of 3TG? (*)	Answer	Comments
Tantalum		
Tin		
Gold		
Tungsten		

6) For each conflict metal, have you identified all of the smelters your company and its suppliers use to supply the products included within the declaration scope indicated above? (*)	Answer	Comments
Tantalum		
Tin		
Gold		
Tungsten		

7) Has all applicable smelter information received by your company been reported in this declaration? (*)	Answer	Comments
Tantalum		
Tin		
Gold		
Tungsten		

Answer the Following Questions at a Company Level

Question	Answer	Comments
A. Do you have a policy in place that addresses conflict minerals sourcing?	Yes	
B. Is your conflict minerals sourcing policy publicly available on your website? (Note – If yes, the user shall specify the URL in the comment field.)	Yes	http://www.maxell.co.jp/csr/ecoproducts/csr_supplychain.html
C. Do you require your direct suppliers to be DRC conflict-free?	Yes	
D. Do you require your direct suppliers to source from smelters validated by an independent private sector audit firm?	Yes	
E. Have you implemented due diligence measures for conflict-free sourcing?	No	
F. Do you collect conflict minerals due diligence information from your suppliers which is in conformance with the IPC-1755 Conflict Minerals Data Exchange standard [e.g., the CFSI Conflict Minerals Reporting Template]?	Yes	
G. Do you request smelter names from your suppliers?	Yes	
H. Do you review due diligence information received from your suppliers against your company's expectations?	No	
I. Does your review process include corrective action management?	No	

J. Are you subject to the SEC Conflict Minerals rule?	No	

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Note: The following list of smelter names does not represent the CFSP Compliant Smelters or all smelters worldwide. Refer to the CFSI website for the most current version of the CFSP Compliant Smelter List and CFSI Standard Smelter List: http://www.conflictfreesourcing.org

Metal	Standard Smelter Names	Smelter Facility Location: Country	Old Smelter ID	New Smelter ID
Tin	Alpha	UNITED STATES	2USA001	CID000292
Tin	China Rare Metal Materials Company	CHINA	Added post old ID proce	CID000244
Tin	China Tin Group Co., Ltd.	CHINA	2CHN015	CID001070
Tin	CNMC (Guangxi) PGMA Co. Ltd.	CHINA	2CHN050	CID000278
Tin	Cooper Santa	BRAZIL	2BRA063	CID000295
Tin	CV Serumpun Sebalai	INDONESIA	2IDN008	CID000313
Tin	CV United Smelting	INDONESIA	2IDN009	CID000315
Tin	EM Vinto	BOLIVIA	2BOL010	CID000438
Tin	Estanho de Rondônia S.A.	BRAZIL	2BRA067	CID000448
Tin	Fenix Metals	POLAND	2POL064	CID000468
Tin	Gejiu Non-Ferrous Metal Processing Co. Ltd.	CHINA	2CHN012	CID000538
Tin	Gejiu Zi-Li	CHINA	2CHN011	CID000555
Tin	Huichang Jinshunda Tin Co. Ltd	CHINA	2CHN052	CID000760
Tin	Jiangxi Nanshan	CHINA	2CHN014	CID000864
Tin	Kai Unita Trade Limited Liability Company	CHINA	2CHN053	CID000942
Tin	Linwu Xianggui Smelter Co	CHINA	2CHN055	CID001063
Tin	Magnu's Minerais Metais e Ligas LTDA	BRAZIL	Added post old ID proce	CID002468
Tin	Malaysia Smelting Corporation (MSC)	MALAYSIA	2MYS016	CID001105
Tin	Melt Metais e Ligas S/A	BRAZIL	Added post old ID proce	CID002500
Tin	Metallo Chimique	BELGIUM	2BEL017	CID001143
Tin	Mineração Taboca S.A.	BRAZIL	2BRA018	CID001173
Tin	Minmetals Ganzhou Tin Co. Ltd.	CHINA	2CHN051	CID001179
Tin	Minsur	PERU	2PER019	CID001182
Tin	Mitsubishi Materials Corporation	JAPAN	2JPN020	CID001191
Tin	Novosibirsk Integrated Tin Works	RUSSIAN FEDERATION	2RUS021	CID001305
Tin	O.M. Manufacturing (Thailand) Co., Ltd.	THAILAND	Added post old ID proce	CID001314
Tin	OMSA	BOLIVIA	2BOL022	CID001337
Tin	PT Artha Cipta Langgeng	INDONESIA	2IDN024	CID001399
Tin	PT Babel Inti Perkasa	INDONESIA	2IDN025	CID001402
Tin	PT Bangka Putra Karya	INDONESIA	2IDN028	CID001412
Tin	PT Bangka Tin Industry	INDONESIA	2IDN058	CID001419
Tin	PT Belitung Industri Sejahtera	INDONESIA	2IDN030	CID001421
Tin	PT Bukit Timah	INDONESIA	2IDN032	CID001428
Tin	PT DS Jaya Abadi	INDONESIA	2IDN059	CID001434
Tin	PT Eunindo Usaha Mandiri	INDONESIA	2IDN033	CID001438
Tin	PT Karimun Mining	INDONESIA	2IDN062	CID001448
Tin	PT Mitra Stania Prima	INDONESIA	2IDN037	CID001453
Tin	PT Prima Timah Utama	INDONESIA	2IDN007	CID001458
Tin	PT REFINED BANGKA TIN	INDONESIA	2IDN038	CID001460
Tin	PT Sariwiguna Binasentosa	INDONESIA	2IDN039	CID001463
Tin	PT Stanindo Inti Perkasa	INDONESIA	2IDN040	CID001468
Tin	PT Tambang Timah	INDONESIA	2IDN049	CID001477
Tin	PT Timah (Persero), Tbk	INDONESIA	2IDN042	CID001482
Tin	PT Tinindo Inter Nusa	INDONESIA	2IDN044	CID001490
Tin	Rui Da Hung	TAIWAN	Added post old ID proce	CID001539
Tin	Soft Metais, Ltda.	BRAZIL	2BRA066	CID001758
Tin	Thaisarco	THAILAND	2THA046	CID001898
Tin	White Solder Metalurgia e Mineração Ltda.	BRAZIL	2BRA054	CID002036
Tin	Yunnan Chengfeng Non-ferrous Metals Co.,Ltd.	CHINA	2CHN047	CID002158
Tin	Yunnan Tin Company, Ltd.	CHINA	2CHN048	CID002180

To ensure all required fields have been populated before submitting to your customers review form for any line items highlighted in red

Required fields remaining to be completed

Click here to return to Declaration tab

Click here to return to Product List

Required Fields	Answer provided	Notes	Hyperlink to source
Company Name (*):	Hitachi Maxell, Ltd.	Completed	
Declaration Scope or Class (*):	B. Product (or List of Products)	Completed	
Go to Product List tab to enter products this declaration		Completed	
Contact Name (*):	Takayuki Nishi	Completed	
Email – Contact (*):	takayuki-nishi@maxell.co.jp	Completed	
Phone – Contact (*):	+81-794-63-8054	Completed	
Authorizer (*):	Kenichi Sano	Completed	
Email - Authorizer (*):	kenichi-sano@maxell.co.jp	Completed	
Phone - Authorizer (*):	+81-794-63-8054	Completed	
Effective Date (*):	1-Apr-2015	Completed	
1) Is the conflict metal intentionally added to your product? (*)	*	*	*
Tantalum (*)	No	Completed	
Tin (*)	No	Completed	
Gold (*)	No	Completed	
Tungsten (*)	No	Completed	
2) Is the conflict metal necessary to the production of your company's products and contained in the finished product that your company manufactures or contracts to manufacture? (*)	*	*	*
Tantalum (*)	No	Completed	
Tin (*)	No	Completed	
Gold (*)	No	Completed	
Tungsten (*)	No	Completed	
3) Does any of the conflict metal originate from the covered countries? (*)	*	*	*
Tantalum		Completed	
Tin		Completed	
Gold		Completed	
Tungsten		Completed	
4) Does 100 percent of the conflict metal (necessary to the functionality or production of your products) originate from recycled or scrap sources? (*)	*	*	*
Tantalum		Completed	
Tin		Completed	
Gold		Completed	
Tungsten		Completed	
5) Have you received conflict metals data/information for each metal from all relevant suppliers of 3TG? (*)	*	*	*
Tantalum		Completed	
Tin		Completed	
Gold		Completed	
Tungsten		Completed	
6) For each conflict metal, have you identified all of the smelters your company and its suppliers use to supply the products included within the declaration scope indicated above? (*)	*	*	*
Tantalum		Completed	
Tin		Completed	
Gold		Completed	
Tungsten		Completed	
7) Has all applicable smelter information received by your company been reported in this declaration? (*)	*	*	*
Tantalum		Completed	
Tin		Completed	
Gold		Completed	
Tungsten		Completed	
Question	*	*	*
A. Do you have a policy in place that addresses conflict minerals sourcing?	Yes	Completed	
B. Is your conflict minerals sourcing policy publicly available on your website? (Note – If yes, the user shall specify the URL in the comment field.)	Yes	Completed	
The URL in the comment field	http://www.maxell.co.jp/csr/ecoproducts/csr_supplychain.html	Completed	
C. Do you require your direct suppliers to be DRC conflict-free?	Yes	Completed	
D. Do you require your direct suppliers to source from smelters validated by an independent private sector audit firm?	Yes	Completed	
E. Have you implemented due diligence measures for conflict-free sourcing?	No	Completed	
F. Do you collect conflict minerals due diligence information from your suppliers which is in conformance with the IPC-1755 Conflict Minerals Data Exchange standard [e.g., the CFSI Conflict Minerals Reporting Template]?	Yes	Completed	
G. Do you request smelter names from your suppliers?	Yes	Completed	
H. Do you review due diligence information received from your suppliers against your company's expectations?	No	Completed	
I. Does your review process include corrective action management?	No	Completed	
J. Are you subject to the SEC Conflict Minerals rule?	No	Completed	
Product List	One or more product / item numbers have been provided	Completed	
Smelter List	No smelter names provided on Smelter List tab	Completed	

Completion required only if reporting level "Product (or List of Products)" selected on the 'Declaration' worksheet.

Click here to return to Declaration tab

Manufacturer's Product Number (*)	Manufacturer's Product Name	Comments
CR2032H	Lithium Manganese Dioxide Battery	

5.

molex接頭規格表
SGS報告書

molex	PRODUCT SPECIFICATION	molex	LANGUAGE JAPANESE ENGLISH

[1. 適用範囲　SCOPE]

本仕様書は、＿＿＿

[3. 定格及び適用電線　RATINGS AND APPLICABLE WIRES]

項　　目 Item	規　　格 Standard		
最大許容電圧 Rated Voltage (MAX.)	125 V（実効値 rms）		[AC(実効値　rms) / DC] 被覆外径： 0.5～1.04mm MAX. Insulation　O.D
最大許容電流 及び適用電線 Rated Current (MAX.) and Applicable wires	AWG. #26	1.0 A	
	AWG. #28	1.0 A	
	AWG. #30	1.0 A	
	AWG. #32	0.8 A	
使用温度範囲 Ambient Temperature Range	-40℃　～　+85℃*1		

*1: 通電による温度上昇分も含む。
Including terminal temperature rise.

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[4. 性能　PERFORMANCE]

4-1. 電気的性能　ELECTRICAL PERFORMANCE

項　目 Item		条　件 Test Condition	規　格 Requirement
4-1-1	接触抵抗 Contact Resistance	コネクタを嵌合させ、開放電圧20mV 以下、短絡電流　10mA以下にて測定する。 (JIS C5402 5.4) Mate connectors, measure by dry circuit, 20mV MAX., 10mA MAX. (JIS C5402 5.4)	20 milliohm MAX.
4-1-2	絶縁抵抗 Insulation Resistance	コネクタを嵌合させ、隣接するターミナル間及びターミナル、アース間に、DC 500V を印加し測定する。 (JIS C5402 5.2/MIL-STD-202 試験法 302B) Apply 500V DC between adjacent terminals or terminal and ground. (JIS C5402 5.2/MIL-STD-202 Method 302B)	100 Megohm MIN.
4-1-3	耐電圧 Dielectric Strength	コネクタを嵌合させ、隣接するターミナル間及びターミナル、アース間に、AC 250V （実効値）を 1分間 印加する。 (JIS C5402 5.1/MIL-STD-202 試験法 301) Apply 250V AC(rms) between adjacent terminals or terminal and ground for 1 minute. (JIS C5402 5.1/MIL-STD-202 Method 301)	異状なきこと No Breakdown
4-1-4	圧着部接触抵抗 Contact Resistance on Crimped Portion	ターミナルに適合電線を圧着し、開放電圧20mV 以下、短絡電流 10mA以下 にて測定する。 Crimp the applicable wire to the terminal, and measure contact resistance by dry circuit, 20mV MAX., 10mA.MAX.	5 milliohm MAX.

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4-2. 機械的性能　MECHANICAL PERFORMANCE

項　目 Item		条　件 Test Condition	規　格 Requirement	
4-2-1	挿入力 及び抜去力 Insertion and Withdrawal Force	毎分 25±3mm の速さで挿入、抜去を行う。 Insert and withdraw connectors at the speed rate of 25±3mm/minute.	第 7 参照 Refer to paragraph 7	
4-2-2	圧着部 引張り強度 Crimping Strength	圧着されたターミナルを治具に固定し、電線 を軸方向に毎分25±3mm の速さで引張る。 (JIS C5402 6.8) Fix the crimped terminal, apply axial pull out force on the wire at the speed rate of 25±3mm/minute. (JIS C5402 6.8)	AWG. #26	9.8 N｛1.0kgf｝MIN.
			AWG. #28	9.8 N｛1.0kgf｝MIN.
			AWG. #30	4.9 N｛0.5kgf｝MIN.
			AWG. #32	3.0 N｛0.3kgf｝MIN.
4-2-3	ターミナル 挿入力 Terminal Insertion Force	圧着されたターミナルをハウジングに挿入する。 Insert the crimped terminal into the housing.	4.9 N｛0.5kgf｝MAX.	
4-2-4	ターミナル 保持力 Terminal/ Housing Retention Force	圧着されたターミナルをハウジングに装着し、 電線を軸方向に毎分 25±3mm の速さで引張る。 Apply axial pull out force to the terminal assembled in the housing at the speed rate of 25±3mm/minute.	4.9 N｛0.5kgf｝MIN.	
4-2-5	ピン保持力 Pin Retention Force	毎分　25±3mm　の速さで　ピンを軸方向に 押す。 Apply axial push force at the speed rate of 25±3mm/minute.	4.9 N｛0.5kgf｝MIN.	

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4-3. その他　OTHERS

項　目 Item		条　件 Test Condition	規　格 Requirement	
4-3-1	繰り返し挿抜 Repeated Insertion/ Withdrawal	1分間に10回以下の速さで挿入、抜去を30回繰り返す。 When mated up to 30 cycles repeatedly by the rate of 10 cycles per minute.	接触抵抗 Contact Resistance	40 milliohm MAX.
4-3-2	温度上昇 Temperature Rise	コネクタを嵌合させ、最大許容電流を通電し、コネクタの温度上昇分を測定する。 (UL 498) Carrying rated current load. (UL 498)	温度上昇 Temperature Rise	30℃ MAX.
4-3-3	耐振動性 Vibration	DC 1mA 通電状態にて、嵌合軸を含む互いに垂直な３方向に掃引割合10～55～10Hz/分全振幅　1.5mmの振動を各２時間加える。 (JIS C60068-2-6/MIL-STD-202 試験法 201) Amplitude : 1.5mm P-P Sweep time : 10-55-10 Hz in 1 minute Duration : 2 hours in each X.Y.Z. axes (JIS C60068-2-6/MIL-STD-202 Method 201)	外　観 Appearance	異状なきこと No Damage
			接触抵抗 Contact Resistance	40 milliohm MAX.
			瞬　断 Discontinuity	1.0 microsecond MAX.
4-3-4	耐衝撃性 Shock	DC 1mA 通電状態にて、嵌合軸を含む互いに垂直な6方向に490m/s² {50G}、の衝撃を各3回加える。 （JIS C60068-2-27/MIL-STD-202 試験法213） 490m/s² {50G}, 3 strokes in each X.Y.Z. axes. (JIS C60068-2-27 MIL-STD-202 Method 213)	外　観 Appearance	異状なきこと No Damage
			接触抵抗 Contact Resistance	40 milliohm MAX.
			瞬　断 Discontinuity	1.0 microsecond MAX.
4-3-5	耐熱性 Heat Resistance	コネクタを嵌合させ、85±2℃の雰囲気中に96時間放置後取出し、1～2時間室温に放置する。 （JIS C60068-2-2/MIL-STD-202 試験法108） 85±2℃, 96 hours (JIS C60068-2-2/MIL-STD-202 Method 108)	外　観 Appearance	異状なきこと No Damage
			接触抵抗 Contact Resistance	40 milliohm MAX.

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項　目 Item		条　件 Test Condition	規　格 Requirement	
4-3-6	耐寒性 Cold Resistance	コネクタを嵌合させ、-40±3℃の雰囲気中に96時間放置後取出し、１～2時間室温に放置する。 （JIS C60068-2-1） -40±3℃, 96 hours (JIS C60068-2-1)	外　観 Appearance	異状なきこと No Damage
			接触抵抗 Contact Resistance	40 milliohm MAX.
4-3-7	耐湿性 Humidity	コネクタを嵌合させ、60±2℃、相対温度90～95%の雰囲気中に96時間放置後取出し、１～2時間室温に放置する。 （JIS C60068-2-3/MIL-STD-202試験法103） Temperature　:　60±2℃ Relative Humidity　:　90～95% Duration　:　96　hours (JIS C60068-2-3/MIL-STD-202 Method 103)	外　観 Appearance	異状なきこと No Damage
			接触抵抗 Contact Resistance	40 milliohm MAX.
			耐 電 圧 Dielectric Strength	4-1-3項を満たすこと Must meet 4-1-3
			絶縁抵抗 Insulation Resistance	10 Megohm MIN.
4-3-8	温度サイクル Temperature Cycling	コネクタを嵌合させ、-55℃に30分、+105℃に30分　これを1サイクルとし、5サイクル繰り返す。但し、温度移行時間は5分以内とする。試験後、1～2時間室温に放置する。 (JIS C0025) 5 cycles of : a) –　55℃　30 minutes b) +105℃　30 minutes (JIS C0025)	外　観 Appearance	異状なきこと No Damage
			接触抵抗 Contact Resistance	40 milliohm MAX.
4-3-9	塩水噴霧 Salt Spray	コネクタを嵌合させ、35±2℃ にて 5±1%重量比の塩水を48±4時間噴霧し、試験後常温で水洗いした後、室温で乾燥させる。 (JIS C60068-2-11/MIL-STD-202 試験法101) 48±4 hours exposure to a salt spray from the 5±1% solution at 35±2℃. (JIS C60068-2-11/MIL-STD-202 Method 101)	外　観 Appearance	異状なきこと No Damage
			接触抵抗 Contact Resistance	40 milliohm MAX.

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項　目 Item		条　件 Test Condition	規　格 Requirement	
4-3-10	耐亜硫酸ガス SO_2 Gas	コネクタを嵌合させ、40±2℃ にて 50±5ppm の亜硫酸ガス中に 24時間 放置する。 24 hours expose to 50±5ppm . SO_2 gas at 40±2℃.	外　観 Appearance	異状なきこと No Damage
			接触抵抗 Contact Resistance	40 milliohm MAX.
4-3-11	耐アンモニア性 NH_3 Gas	コネクタを嵌合させ、濃度28%のアンモニア水 を入れた容器中に40分間放置する。 （1Lに対して25mLの割合） 40 minutes exposure to NH_3 gas evaporating from 28% Ammonia solution.	外　観 Appearance	異状なきこと No Damage
			接触抵抗 Contact Resistance	40 milliohm MAX.
4-3-12	半田付け性 Solderability	端子先端より0.5mm迄、及び金具先端を 245±3℃の半田に3±0.5秒浸す。 Soldering Time : 3±0.5 sec. Solder Temperature : 245±3℃ 0.5mm from terminal tip and fitting nail tip.	濡れ性 Solder Wetting	浸漬面積の 95%以上 95% of immersed area must show no voids, pin holes
4-3-13	半田耐熱性 Resistance To Solder-Ing Heat	(リフロー時) 第6項の条件を2回繰り返す。 When reflowing Repeat paragraph 6, condition two times.	端子ガタ、割れ等 異状なきこと No Damage	
		(手半田) 端子先端より0.5mm迄、及び金具先端を、 370～400℃の半田ゴテにて、 最大5秒 加熱する。 Soldering iron method Soldering time : 5 sec. MAX. Solder temperature : 370～400℃ 0.5mm from terminal tip and fitting nail tip		

（　　）：参考規格　Reference Standard

{　　}：参考単位　Reference Unit

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[5. 外観形状、寸法及び材質　PRODUCT SHAPE, DIMENSIONS AND MATERIALS]

図面参照　Refer to the drawing.

[6.赤外線リフロー条件　INFRARED REFLOW CONDITION]

温度条件グラフ
(温度は基板パターン面)
TEMPERATURE CONDITION GRAPH
(TEMPERATURE ON THE SURFACE OF P.C.BOARD PATTERN)

注記；本リフロー条件に関しては、リフロー装置及び基板などにより条件が異なりますので、
事前にリフロー評価の確認をお願い致します。
また吸湿などの前処理は行わないで下さい。

NOTE ; Please check the reflow soldering condition by your own devices beforehand.
Because the condition changes by the soldering devices, P.C.Boards, and so on.
No moisture treatment before reflow process.

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[7. 挿入力及び抜去力 INSERTION / WITHDRAWAL FORCE]

極数 No. of CKT.	単位 Unit	挿入力（最大値） Insertion force (MAX.)			抜去力（最小値） Withdrawal force (MIN.)		
		初回 1st	6回目 6th	30回目 30th	初回 1st	6回目 6th	30回目 30th
2	N { kgf }	19.6 { 2.0 }	17.6 { 1.8 }	15.6 { 1.6 }	2.8 { 0.28 }	2.3 { 0.23 }	1.8 { 0.18 }
3	N { kgf }	24.5 { 2.5 }	22.5 { 2.3 }	20.5 { 2.1 }	3.0 { 0.30 }	2.5 { 0.25 }	2.0 { 0.20 }
4	N { kgf }	29.4 { 3.0 }	27.4 { 2.8 }	25.4 { 2.6 }	3.3 { 0.33 }	2.8 { 0.28 }	2.3 { 0.23 }
5	N { kgf }	34.3 { 3.5 }	32.3 { 3.3 }	30.3 { 3.1 }	3.8 { 0.38 }	3.3 { 0.33 }	2.8 { 0.28 }
6	N { kgf }	39.2 { 4.0}	37.2 { 3.8 }	35.2 { 3.6 }	4.3 { 0.43 }	3.8 { 0.38 }	3.3 { 0.33 }
7	N { kgf }	44.1 { 4.5}	42.1 { 4.3 }	40.1 { 4.1 }	4.7 { 0.48 }	4.3 { 0.43 }	3.8 { 0.38 }
8	N { kgf }	49.0 { 5.0 }	47.0 { 4.8 }	45.0 { 4.6 }	5.2 { 0.53 }	4.7 { 0.48 }	4.3 { 0.43 }
9	N { kgf }	53.9 { 5.5 }	51.9 { 5.3 }	49.9 { 5.1 }	5.5 { 0.56 }	5.0 { 0.51 }	4.5 { 0.46 }
10	N { kgf }	58.8 { 6.0 }	56.8 { 5.8 }	54.8 { 5.6 }	5.8 { 0.59 }	5.3 { 0.54 }	4.8 { 0.49 }
11	N { kgf }	63.7 { 6.5 }	61.7 { 6.3 }	59.7 { 6.1}	6.1 { 0.62 }	5.6 { 0.57 }	5.1 { 0.52 }
12	N { kgf }	68.6 { 7.0 }	66.6 { 6.8 }	64.6 { 6.6}	6.4 { 0.65 }	5.9 { 0.60 }	5.4 { 0.55 }
13	N { kgf }	73.5 { 7.5 }	71.5 { 7.3 }	69.5 { 7.1 }	6.7 { 0.68 }	6.2 { 0.63 }	5.7 { 0.58 }
14	N { kgf }	78.4 { 8.0 }	76.4 { 7.8 }	74.4 { 7.6 }	7.0 { 0.71 }	6.5 { 0.66 }	6.0 { 0.61 }
15	N { kgf }	83.3 { 8.5 }	81.3 { 8.3 }	79.3 { 8.1 }	7.3 { 0.74 }	6.8 { 0.69 }	6.3 { 0.64 }
17	N { kgf }	93.1 { 9.5 }	91.2 { 9.3 }	89.2 { 9.1 }	7.9 { 0.8 }	7.4 { 0.75 }	6.9 { 0.70 }

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PRODUCT SPECIFICATION

LANGUAGE

JAPANESE
ENGLISH

REV.	REV. RECORD	DATE	EC NO.	WRTTN:	CH'K:
A	RELEASED	'04/02/05	J2004-2276	E.SUZUKI	K.TOJO
B	REVISED	'04/03/10	J2004-3002	E.SUZUKI	K.TOJO
C	REVISED	'04/03/29	J2004-3401	E.SUZUKI	K.TOJO
D	REVISED	'04/07/21	J2005-0243	N.AIDA	K.TOJO
E	REVISED	'04/12/06	J2005-1671	E.SUZUKI	K.TOJO
F	REVISED	'05/02/15	J2005-2371	E.SUZUKI	K.TOJO
G	REVISED	'05/04/19	J2005-3130	N.AIDA	K.TOYODA

REVISE ON PC ONLY	
G	SEE SHEET 1 OF 10
REV.	DESCRIPTION

TITLE:
1.25mm PITCH WIRE TO BOARD CONNECTOR
-LEAD FREE- 製品仕様書

THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INC. AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

DOCUMENT NUMBER	FILE NAME	SHEET
PS-51021-024	PS51021024.DOC	12 OF 10

RoHS Certificate of Compliance

09/19/2016

Molex is committed to managing the use of chemical substances in accordance with governmental regulations, industry standards, and customer-specific requirements in order to protect the environment. For each part listed, this document provides:

• **EU RoHS Compliance Status.** EU RoHS status is declared per Directive 2011/65/EU and its subsequent amendments. Homogeneous materials of parts that are compliant to this legislation have less than 0.1% by weight each of lead, mercury, hexavalent chromium, PBB, and PBDE, and 0.01% by weight of cadmium. In situations where an exemption applies, the preceding limits, corresponding to the exempted substance(s), may be higher.

Molex's sole liability for incorrectly certifying a product shall be either replacement of the Molex product or, alternatively and in the sole discretion of Molex, return of the purchase price paid for the relevant Molex product.

For additional information regarding Molex's environmental initiatives and further explanation of this information, please visit www.molex.com

Haim Eliyahu
Manager, Global Product Compliance

Table A

Molex Part Number	Part Description	RoHS Compliance Status
0500798000	1.25mm Pitch PicoBlade™ Crimp Terminal, 26-28 AWG, Reel	Compliant

注記
NOTES

1. 適合ハウジング：51021シリーズ
   APPLICABLE HOUSING : 51021 SERIES
2. メッキ仕様　PLATING
   錫 0.9μm MIN. リフロー処理（前メッキ）
   TIN 0.9μm MIN. REFLOW TREATMENT (PRE-PLATED)

SECT. A-A

SECT. B-B

50079-8100	バラ状 LOOSE
50079-8000	連鎖状 CHAIN
MATERIAL NO.	端子形状 FORM

MODEL NO. 50079-8*00

材料 MATERIAL	リン青銅 (t=0.15) PHOSPHOR BRONZE
仕上げ FINISH	—#—
適用電線範囲 WIRE RANGE	AWG #26-28
被覆外径 INS. RANGE	Ø0.5-1.04

REVISED
EC NO: J2005-1535
DRWN:ESUZUKI 2004/11/30
CHKD:KTOJO 2004/11/30
APPR:NUKITA 2004/12/06
G
REV DESCRIPTION

GENERAL TOLERANCES (UNLESS SPECIFIED)

10 UNDER	±0.2
10 OVER 30 UNDER	±0.25
30 OVER	±0.3
ANGULAR ±3 °	

DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS

DIMENSION STYLE: MM ONLY	SCALE: 20:1	DESIGN UNITS: METRIC	THIRD ANGLE PROJECTION
DRAWN BY: HHIRAMOT	DATE: 92/10/21	TITLE: 1.25 WIRE TO BOARD CONN. CRIMP REC.TERMINAL -LEAD FREE-	
CHECKED BY: SKUNISHI	DATE: 98/07/07		
APPROVED BY: MFUKUSHI	DATE: 98/07/07	molex MOLEX INCORPORATED	
MATERIAL NO.: SEE CHART		DOCUMENT NO.: SD-50079-001	SHEET NO.: 1 OF 1
SIZE: A3			

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MODEL NO./MATERIAL NO.		
53261-****	WAFER ASSY	
50079-****	TERMINAL	REC.
51021-****	HOUSING	

RELEASED	EC NO: J2006-2426	2006/02/02
	DRWN:YAOYAGI	2006/02/03
	CHKD:YMAEDA	2006/02/07
	APPR:NUKITA	
DESCRIPTION		
REV	0	

GENERAL TOLERANCES (UNLESS SPECIFIED)

10 UNDER	±---
10 OVER 30 UNDER	±---
30 OVER	±---
ANGULAR	±--- °

DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS

DIMENSION STYLE: MM ONLY	SCALE: ---	DESIGN UNITS: METRIC	THIRD ANGLE PROJECTION
DRAWN BY: Y.AOYAGI	DATE: 2006/01/30	TITLE: 1.25 W-TO-B CONN. 51021,53261 MATING CROSS SECTION	
CHECKED BY: Y.MAEDA	DATE: 2006/01/30		
APPROVED BY: N.UKITA	DATE: 2006/01/30	molex MOLEX INCORPORATED	
MATERIAL NO.: SEE CHART		DOCUMENT NO.: SD-51021-002	SHEET NO.: 1 OF 1
SIZE: A3			

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DWG. NO. SD-51021-**00

SECT. G-G

注記 NOTES

1 適合ターミナル：50058, 50079 シリーズ
APPLICABLE TERMINAL : 50058, 50079 SERIES

2 嵌合相手： 53047, 53048, 53261, 53398 シリーズ
MATE WITH : 53047, 53048, 53261, 53398 SERIES

3 ロックは，2，3極は1ヶ，4極以上は2ヶとする。
LOCKING WINDOW : ONE PLACE FOR 2 & 3 CKT.
AND TWO PLACES FOR MORE THAN 3 CKT.

C	B	A	ENG.NO.	極数 CKTS.
20.5	19.2	17.5	51021-1500	15
19.25	17.95	16.25	-1400	14
18	16.7	15	-1300	13
16.75	15.45	13.75	-1200	12
15.5	14.2	12.5	-1100	11
14.25	12.95	11.25	-1000	10
13	11.7	10	-0900	9
11.75	10.45	8.75	-0800	8
10.5	9.2	7.5	-0700	7
9.25	7.95	6.25	-0600	6
8	6.7	5	-0500	5
6.75	5.45	3.75	-0400	4
5.5	4.2	2.5	-0300	3
4.25	2.95	1.25	51021-0200	2

:MM DIMENSIONS IN METRIC DO NOT SCALE DRAWING

角度 ANGLE	±3°				
30 以上 OVER	±0.3				
10 以上 OVER 30 未満 UNDER	±0.25				
10 未満 UNDER	±0.2	D	変更及び再作図 REVISED&REDRAWN	LJ305221	K.T H.H '93/6/1
一般公差 GENERAL TOLERANCES		記号 LTR	変更内容 REVISION RECORD		DR. CHK. 日付 DATE

材料 MATERIAL: PBTP UL94V-0

仕上げ FINISH: —

適用電線範囲 WIRE RANGE: —

被覆外径 INS. RANGE: —

DRAWN BY '93/6/1 K.TOJO

CHK'D BY '93/6/1 H.HIRAMOTO

APP'D BY '93/6/1 M.FUKUSHIMA

尺度 SCALE 10 : 1

MOLEX-JAPAN CO.,LTD. 日本モレックス株式会社

REVISE ONLY ON CAD SYSTEM

TITLE 名称

1.25 WIRE TO BOARD CONN.
RECEPTACLE HOUSING

DWG. NO. SD-51021-**00

REV D

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本図面は日本モレックス（株）の所有する情報を含むもので当社の許可なく複製を禁止する。

EN-01C(032)MXJ-32

51021.S11

MODEL NO./MATERIAL NO.		
53261-****	WAFER ASSY	
50079-****	TERMINAL	REC.
51021-****	HOUSING	

RELEASED	EC NO: J2006-2426	2006/02/02
	DRWN:YAOYAGI	2006/02/03
	CHKD:YMAEDA	2006/02/07
	APPR:NUKITA	
DESCRIPTION		
REV	0	

GENERAL TOLERANCES (UNLESS SPECIFIED)

10 UNDER	±---
10 OVER 30 UNDER	±---
30 OVER	±---
ANGULAR	±--- °

DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS

DIMENSION STYLE: MM ONLY	SCALE: ---	DESIGN UNITS: METRIC	THIRD ANGLE PROJECTION
DRAWN BY: Y.AOYAGI	DATE: 2006/01/30	TITLE: 1.25 W-TO-B CONN. 51021,53261 MATING CROSS SECTION	
CHECKED BY: Y.MAEDA	DATE: 2006/01/30		
APPROVED BY: N.UKITA	DATE: 2006/01/30	molex MOLEX INCORPORATED	
MATERIAL NO.: SEE CHART		DOCUMENT NO.: SD-51021-002	SHEET NO.: 1 OF 1
SIZE: A3			

THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

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Product Compliance Statement

September 13, 2016

Molex is committed to managing the use of chemical substances in accordance with governmental regulations, industry standards, and customer-specific requirements in order to protect the environment. For each part listed, this document provides:

- **EU RoHS Compliance Status.** EU RoHS status is declared per Directive 2011/65/EU and its subsequent amendments. Homogeneous materials of parts that are compliant to this legislation have less than 0.1% by weight each of lead, mercury, hexavalent chromium, PBB, and PBDE, and 0.01% by weight of cadmium. In situations where an exemption applies, the preceding limits, corresponding to the exempted substance(s), may be higher.

- **EU REACH SVHC Content.** Substances of Very High Concerns (SVHCs) are declared if above 0.1% of the article per Regulation (EC) No. 1907/2006 and its subsequent amendments. The Candidate List of SVHCs is continually updated at http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp.

- **Low-Halogen Status.** Homogeneous materials of parts that are considered Low-Halogen have less than 0.09% by weight each of bromine and chlorine, and less than 0.15% by weight of the sum of bromine and chlorine.

Molex's sole liability for incorrectly certifying a product shall be either replacement of the Molex product or, alternatively and in the sole discretion of Molex, return of the purchase price paid for the relevant Molex product.

For additional information regarding Molex's environmental initiatives and further explanation of this information, please visit www.molex.com

Haim Eliyahu
Manager, Global Product Compliance

Table A

Molex P/N	Part Description	RoHS Compliance Status	REACH SVHC	Low-Halogen Status
0510210200	1.25mm Pitch PicoBlade™ Wire-to-Wire and Wire-to-Board Housing, Female, 2 Circuits	Compliant	Not Contained Per -ED/21/2016 (20 June 2016)	Not Low-Halogen

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ECBT2.E29179
Connectors for Use in Data, Signal, Control and Power Applications - Component

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Connectors for Use in Data, Signal, Control and Power Applications - Component

See General Information for Connectors for Use in Data, Signal, Control and Power Applications - Component

MOLEX INCORPORATED E29179
2222 WELLINGTON CT
LISLE, IL 60532 USA

Backplane interconnect system connectors, Model(s) 75705, 75710, 75910, 75991, 76011, 76015, 76020, 76030, 76035, 76040, 76055, 76060, 76142, 76145, 76150, 76152, 76155, 76160, 76162, 76163, 76165, 76170, 76275, 76410, 76450, 76453, 76455, 76460, 76500, 76680, 76910, 76929, 78226, 78227, 78228, 78229, 78230, 78231, 78232, 78233, 78234, 78235, 78236, 78237, 78239, GbX, VHDM

Connector modules, Model(s) 45500, 45501, 45502, 45503, 45504, 45505, 45506, 45507, 45508, 45509, 45510, 45511, 45512, 45513, 45514, 45515, 45516, 45517, 45518, 45519, 45520, 45521, 45522, 45523, 45524, 45525, 45526, 45527, 45528, 45529, 45530, 45531, 45536, 45537, 45538, 45539, 45541, 45542, 45543, 45544, 45545, 45546, 45547, 45549, 45550, 45630, 45631, 45632, 45633, 45634, 45635, 45636, 45637, 45638, 45648, 45660, 45819, 45820, 45861, 45862, 45863, 45865, 45866, 45867, 78059

Connectors, Model(s) 0039014031, 0039014033, 45481, 45482, 45483, 45484, 45485, 45714, 45719, 45840, 45841, 46079, 46081, 46225, 46394, 46396, 46408, 46409, 46436, 46437, 46437-1059, 46562, 46586, 46707, 46709, 46726, 46817, 46818, 47222, 47300, 47306, 47634, 67800, 73642, 73643, 73644, 73651, 73656, 73659, 73670, 73769, 73770, 73771, 73781, 73782, 73783, 73798, 73799, 73800, 73801, 73802, 73809, 73810, 73942, 73943, 73944, 74008, 75542, 75545, 75548, 75556, 75561, 75568, 76001, 76541, 76546, 78011, 78012, 78027, 78029, 78054, 78070, 78091, 78102, 78109, 78122, 78159, 78164, 78178, 78266, 78272, 78317, 78367, 78394, 78395, 78396, 78470, 78477, 78482, 78492, 78495, 78500, 78521, 78528, 78797, 85100, 85101, 85102, 85103, 85104, 85105, 85106, 85107, 85108, 85109, 85150, 85151, 85152, 85153, 85154, 85155, 85156, 85157, 85158, 85159, 87703, 87704, 87799, 87812, 87817, 87839, 87844, 87851, 87863, 87892, 87916, 87947, 87970, 87988

Connectors for flat flexible cable, membrane switch tails, planar cable, Model(s) 35224, 35233, 35802, 35857, 40791, 41066, 41975, 4850, 5138, 5143, 52043, 52044, 52045, 52067, 52068, 52103, 52182, 52207, 52234, 52268, 52271, 52287, 52288, 5229, 52425, 52437, 52587, 52610, 52689, 52746, 52893, 52988, 54211, 5553, 5597, 64010, 71220, 71226, 7223, 7275, 7660, 7664, 7674, 7675, 7712, 78030, 78141, 78142, 78375, 78468, 7991, 87394, 87926, 87967, 87971, 87991, 90500, 94529#, 945503#, 945509#

Connectors for SIP packages, SIMM sockets, edge connectors, Model(s) 2184, 2574, 4338, 4504, 48191, 48206, 48302, 6063, 6422, 6511, 6777, 67799, 71003, 71006, 71015, 71109, 71124, 71243, 71251, 71297, 71481, 71736, 71796, 73705, 73817, 73818, 73835, 74080, 74081, 74191, 74398, 78005, 78016, 78035, 78047, 78048, 78049, 78065, 78084, 78176, 78188, 78192, 78193, 78194, 78195, 78199, 78279, 78286, 78308, 78309, 78360, 78407, 78503, 78519, 78520, 78810, 78816, 78824, 78829, 78830, 78832, 78833, 78834, 78835, 78841, 78842, 78844, 78859, 78863, 78867, 78872, 78877, 78881, 78893, 78905, 78906, 78908, 78909, 78910, 78913, 78916, 78920, 78922, 78923, 78924, 78954, 78955, 78961, 78962, 78964, 78968, 78976, 78977, 78993, 87020, 87028, 8708, 87085, 87087, 87122, 87533, 87535, 87538, 87587, 87609, 87630, 87636, 87639, 87645, 87655, 87657, 8769, 87690, 87705, 87786, 87787, 87803, 87810, 87818, 87822, 87825, 87861, 87899, 87918, 87919, 87968, 87969, 87977, 87978, 89212, 90923, 90924

Connectors for specific applications, Model(s) 1028, 105009, 1116, 1257, 1852, 1863, 1943, 2177, 2191, 2211, 2562, 2576, 2698, 2796, 2912, 35135, 35150, 35151, 35153, 35165, 35180, 35181, 35189, 35548, 35561, 35567, 35573, 35955, 35961, 35965, 36538, 36558, 40361, 40362, 40363, 40372, 40373, 40374, 40375, 40376, 40382, 40384, 40392, 40394, 40395, 40585, 41209, 41509, 41644, 41645, 41680, 41755, 42098, 42233, 42295, 42400,

42865, 43032, 43101, 43160, 43180, 43180-5002, 43250, 43275, 43301, 43335, 43384, 4346, 43603, 43680, 43772, 43773, 43796, 43810, 44068, 44167, 44232, 44234, 44421, 44441, 44561, 44562, 44970, 45002, 45774, 46007, 46068, 47099, 47296, 47327, 49386, 49435, 49511, 49537, 49555, 5003, 51093, 5151, 5153, 52485, 52487, 52968, 53330, 53444, 53445, 53717, 54790, 54803, 55618, 55619, 6313, 6557, 6696, 6697, 6722, 6724, 6781, 67811, 6783, 6784, 6786, 6788, 6828, 68416, 68417, 6902, 6963, 73086, 73099, 74065, 74432, 74441, 74988, 75310, 75319, 75450, 75451, 75454, 75460, 75462, 75477, 75586, 75640, 75714, 75733, 75734, 75759, 75783, 75784, 75786, 75787, 76044, 76045, 76046, 76047, 76048, 76064, 76065, 76066, 76067, 76068, 76090, 76091, 76092, 76093, 76094, 76100, 76101, 76102, 76103, 76104, 76870, 76894, 78052, 78053, 78060, 78121, 78285, 78320, 78326, 78459, 78462, 78467, 78486, 8149, 87005, 87013, 87221, 87279, 87360, 87362, 87370, 87403, 87404, 87423, 87443, 87511, 87520, 87530, 87541, 87546, 87570, 87575, 87583, 87619, 87622, 87629, 87723, 87790, 87815, 87945, 87975, 90054, 90410, 90423, 90426, 90833, 90835, 91338, 91886, 94541, 98004

Connectors, 0.0100 in (2.54 mm) center, dense packaging for modular interconnection systems, Model(s) 35565-0300, 35811, 40077, 40556, 42375, 42376, 42377, 44147, 44148, 51029, 51030, 51040, 51041, 51042, 51043, 52107, 52108, 52109, 52112, 52133, 52134, 52135, 52213, 52266, 52299, 52302, 52379, 52385, 52386, 52479, 52480, 52481, 52482, 52483, 52495, 52496, 52506, 52763, 52795, 52877, 53103, 53104, 53105, 53106, 53107, 53108, 53229, 53230, 53233, 53234, 53294, 53296, 53297, 53298, 53299, 53315, 53316, 53317, 53318, 53319, 53320, 53321, 53322, 53323, 53334, 53349, 53483, 53508, 5547, 5548, 68126, 68300, 68301, 68302, 68303, 68304, 68305, 68306, 68307, 68308, 68309, 68310, 68311, 68312, 68313, 68314, 68315, 70004, 70013, 70018, 70022, 70057, 70066, 70104, 70107, 70181, 70182, 70183, 70184, 70185, 70191, 70192, 70194, 70195, 70203, 70204, 70206, 70209, 70210, 70211, 70213, 70216, 70218, 70219, 70220, 70221, 70222, 70223, 70224, 70227, 70229, 70238, 70239, 70240, 70241, 70242, 70243, 70246, 70247, 70252, 70253, 70254, 70255, 70259, 70260, 70261, 70268, 70280, 70287, 70289, 70294, 70295, 70309, 70319, 70329, 70343, 70344, 70345, 70346, 70347, 70364, 70365, 70373, 70374, 70375, 70376, 70377, 70378, 70379, 70380, 70389, 70390, 70391, 70392, 70393, 70394, 70395, 70396, 70400, 70403, 70430, 70431, 70450, 70470, 70475, 70478, 70541, 70542, 70543, 70544, 70545, 70546, 70551, 70552, 70553, 70554, 70555, 70556, 70561, 70562, 70563, 70564, 70565, 70566, 70567, 70568, 70571, 70572, 70573, 70574, 70575, 70576, 70634, 70879, 71164, 71172, 71308, 71384, 71395, 71764, 71850, 71973, 71987, 74095, 74098, 74130, 74162, 74164, 74190, 75100, 75101, 75102, 75730, 7723, 7859, 79085, 79168, 7990, 85001, 85002, 85003, 85009, 85011, 85012, 85013, 85014, 85015, 85017, 85030, 85040, 85042, 85048, 85050, 85052, 85054, 85056, 85160, 85322, 8624, 8676, 87054, 87155, 87156, 87195, 8723, 8724, 87256, 87257, 87258, 87260, 87411, 87424, 87540, 87556, 87797, 87914, 87920, 90059, 90147, 90148, 90160, C7092

Connectors, 0.050 in (1.27 mm) centers for ribbon cable systems, D-subs mating headers, transition connectors, Model(s) 40312, 40315, 40387, 40501, 40502, 40503, 40504, 40505, 40506, 40507, 40508, 40509, 40510, 40511, 40512, 44828, 45339, 45560, 45593, 45802, 45830, 45970, 45971, 46132, 46556, 46557, 4700, 51103, 52007, 52008, 52011, 52012, 52037, 52147, 52151, 52153, 52154, 52273, 5320, 5321, 5328, 5330, 5332, 5336, 5340, 5342, 53426, 5350, 53517, 5360, 53608, 53618, 53619, 5370, 5380, 54037, 5494, 6700, 67211, 67221, 67489, 67490, 67491, 67492, 67582, 6874, 70121, 70491, 70498, 70499, 70625, 70973, 70974, 71061, 71163, 71247, 71295, 71413, 71425, 71430, 71743, 71744, 71891, 7330, 73631, 73776, 73826, 73829, 73976, 7401, 74182, 74302, 74303, 74305, 74306, 74307, 74308, 74314, 74337, 78365, 79058, 79059, 8173, 8621, 87012, 87568, 87571, 87572, 87620, 87641, 87656, 87689, 87694, 87720, 87724, 87741, 87848, 87857, 87985, 90325, 90327, 90571, 90572, 90635, 90663, 90708, 90709, 90814

Connectors, 0.079 to 0.200 in (2.0 to 5.08 mm) centers for PCB with springbox terminals, spox wire-to-board, Model(s) 104046, 104047, 35127, 35128, 35155, 35156, 35164, 35184, 35191, 35199, 35301, 35312, 35313, 35328, 35528, 35530, 42219, 42249, 42267, 43061, 44169, 45578, 45579, 45608, 45609, 45626, 49449, 51005, 51006, 5102, 51038, 51067, 51103, 51107, 51114, 51138, 51198, 5195, 5196, 5197, 5198, 5199, 5207, 5208, 5209, 5231, 5233, 5234, 5240, 5264, 5267, 5268, 53083, 53258, 53259, 53265, 53266, 53375, 53384, 53415, 53426, 53517, 53608, 53618, 53619, 53720, 53727, 5410, 5411, 5418, 5420, 5428, 68143, 68168, 68169, 68173, 68174, 68175, 68176, 68328, 68330, 68332, 68334, 87007, 87608

Connectors, 0.098 to 0.200 in (2.5 to 5.08 mm) centers for PCB interconnections, KK crimp terminals, housings, connectors, headers, insulation displacement connectors, Model(s) 1906, 2139, 2145, 2174, 2220, 2390, 2391, 2402, 2403, 2420, 2461, 2579, 2599, 2630, 2632, 2673, 2695, 2711, 2767, 2802, 2939, 2973, 3000, 3001, 3002, 3003, 3007, 3008, 3011, 3018, 3021, 3022, 3024, 3029, 3033, 3055, 3061, 3069, 3074, 3094, 3192, 3202, 3239, 3246, 3279, 35022, 35023, 35210, 35211, 35300, 35790, 35977, 35978, 35979, 40099, 40136, 40146, 40187, 4030, 40338, 40367, 4042, 40438, 40555, 40611, 40775, 40788, 40798, 40913, 40922, 4094, 40976, 41162, 41399, 41661, 41662, 41671, 41672, 41681, 41682, 41695, 41701, 41711, 41721, 41741, 41743, 41761, 41771, 41772, 41773, 41791, 41792, 4180, 41815, 41851, 41861, 41871, 42009, 42140, 42143, 42225, 42226, 42227, 42228, 42254, 42279, 42441, 42443, 42461, 42471, 42472, 42473, 42491, 42492, 42624, 4281, 42821, 42831, 42841, 42843, 42861, 42871, 42872, 42873, 42891, 42892, 4291, 43009, 4345, 43738, 4380, 4455, 4662, 48103, 48104, 48147, 48271, 49390, 49517, 49518, 5004, 5011, 5028, 5036, 5040, 5045, 5046, 5047, 5048, 5049, 5051, 5054, 5058, 5063, 5065, 5066, 5067, 5080, 5089, 5093, 5094, 5096, 51001, 51011, 51036, 51088, 51144, 51191, 5124, 5127, 5129, 5131, 5132, 5136, 5142, 5145, 5148, 5154, 5180, 5184, 5185, 52075, 5238, 5239, 5242, 5243, 5244, 5245, 5250, 5251, 5252, 5253, 5254, 5258, 5265, 5271, 5272, 5273, 5274, 5275, 5276, 5277, 5278, 5279, 5280, 5281, 5282, 5283, 5284, 5285, 5286, 5287, 5288, 5289, 5290, 5291, 5292, 5293, 5295, 53038, 53039, 53061, 53405, 53406, 53520, 53521, 53525, 5355, 5379, 5386, 5391, 5395, 5414, 5430, 5439, 54457, 54491, 54603, 54823, 5485, 5487, 54892, 54943, 5507, 5530, 5535, 55351, 5536, 55376, 55501, 55502, 55540, 55541, 55637, 5567, 55764, 5579, 5586, 5587, 6124, 6238, 6255, 6266, 6339, 6340, 6345, 6373, 6410, 6442, 6471, 6524, 6663, 6672, 6745, 68340, 68341, 68342,

68343, 68344, 68346, 6837, 70332, 7395, 7478, 75594, 75791, 75800, 75908, 76421, 76691, 76693, 7690, 7720, 7745, 7790, 7795, 7822, 7832, 7880, 8619, 87004, 87051, 87103, 87300, 87585, 87601, 87602, 87605, 87824, 87834, 87898, 8853, 89014, 89015, 8950, 8951, 8994, 90331, 90536, 90647, 90649, 90650, 90652, 90783, 90784, 91228, 91236

Connectors, 0.5 to 2.0 mm center micro for flat flexible cable (FFC), board-to-board, wire-to-board, wire-to-wire, Model(s) 104040, 104041, 104050, 104051, 30404, 30452, 35223, 35234, 35237, 35238, 35303, 35329, 35336, 35337, 35362, 35363, 35507, 35585, 47018, 47022, 47080, 47272, 47628, 47639, 47645, 47650, 48106, 48107, 48148, 48321, 48325, 48330, 48336, 49540, 51004, 51015, 51021, 51024, 51065, 51089, 51090, 51110, 51111, 51112, 51113, 51146, 51353, 52061, 52365, 52435, 52484, 52502, 52504, 52559, 52584, 52635, 52637, 52639, 52643, 52686, 52688, 52691, 52745, 52793, 52806, 52807, 52808, 52841, 52844, 52852, 52872, 52885, 52901, 52918, 53014, 53015, 53025, 53045, 53052, 53053, 53062, 53063, 53067, 53087, 53134, 53253, 53254, 53261, 53263, 53264, 53313, 53314, 53324, 53325, 53358, 53396, 53397, 53398, 53401, 53481, 53543, 53555, 53615, 53661, 53777, 53780, 53857, 53858, 53896, 53974, 54016, 54082, 54083, 54084, 54085, 54088, 54089, 54104, 54111, 54132, 54165, 54269, 54417, 54473, 54526, 54599, 54613, 5480, 5483, 5484, 54975, 55060, 55083, 55091, 5512, 5513, 55270, 5532, 5533, 55445, 55801, 55825, 55917, 5613, 5633, 67155, 68146, 68162, 68163, 68165, 68166, 71075, 71078, 71264, 71265, 71436, 71439, 7166, 71660, 7174, 71741, 73630, 73811, 75003, 75005, 78001, 78019, 78028, 78032, 78033, 78045, 78046, 78067, 78103, 78119, 78127, 78149, 78153, 78167, 78171, 78172, 78175, 78198, 78211, 78212, 78213, 78214, 78216, 78218, 78247, 78264, 78276, 78283, 78312, 78328, 78347, 78348, 78349, 78380, 78393, 78399, 78442, 78445, 78446, 78448, 78451, 78915, 79107, 79108, 79109, 87018, 87019, 87026, 87029, 87038, 87049, 87089, 87091, 87202, 87239, 87259, 87263, 87264, 87267, 87273, 87288, 87293, 87305, 87306, 87307, 87308, 87309, 87320, 87327, 87331, 87332, 87333, 87334, 87338, 87340, 87344, 87354, 87366, 87368, 87369, 87380, 87381, 87383, 87386, 87400, 87429, 87433, 87436, 87437, 87438, 87439, 87512, 87526, 87534, 87537, 87545, 87547, 87550, 87551, 87553, 87555, 87557, 87559, 87563, 87564, 87567, 87577, 87579, 87586, 87599, 87600, 87626, 87635, 87679, 87725, 87758, 87759, 87760, 87766, 87771, 87782, 87783, 87809, 87813, 87819, 87820, 87831, 87832, 87833, 87836, 87838, 87843, 87853, 87856, 87866, 87868, 87869, 87871, 87872, 87875, 87901, 87911, 87937, 87940, 87946, 87953, 87981, 87982, 87983, 87984, 87989, 87990, 89177, 89400, 89401, 89435, 89438, 90858, 90871, 90872, 90879, 91317, 91627, 91716, 91717, 91777, 91778, 91779, 91780, 91791, 91954, 91999, 92000, 93037, 93039, 93050, 93051, 93070, 93071, 93229

Connectors, 41N1 Combos, Model(s) 48000

Connectors, backplane family, Model(s) 74029, 74057, 74058, 74059, 74060, 74061, 74062, 74073, 74074, 74075, 74077, 74078, 74335, 74336, 74457, 74458, 74465, 74466, 74467, 74649, 74650, 74651, 74658, 74659, 74680, 74686, 74880, 74886, 74979, 74980, 74981, 74984, 78368, 87701, 87713, 87780, 87824

Connectors, daughtercard family, Model(s) 74026, 74030, 74040

Connectors, I/O, D-subminatures for round or flat shielded cables in high speed data busing, Model(s) 46765, 46770, 52316, 52866, 53803, 53804, 53805, 53984, 54030, 54306, 54329, 54819, 67023, 67039, 67040, 67041, 67042, 67047, 67068, 67329, 67354, 67430, 71310, 71325, 71350, 71355, 71505, 71564, 71565, 74703, 74704, 74780, 82008, 82009, 82012, 82020, 82033, 82034, 82047, 87112, 87118, 87119, 87123, 87203, 87204, 87220, 87226, 87418, 87525, 87531, 87552, 89180, 89181, 89219, 89220, 89221, 89269, 89270, 89271, 89432, 89450, 89459, 89460, 89461, 89462, 89485

Connectors, LFH system, Model(s) 70660, 70665, 70928, 70929, 71182, 71230, 71235, 71475, 71478, 71536, 71537, 71624, 71626, 71631, 71633, 71691, 71718, 71719, 71720, 71754, 74150, 74320, 74323, 74383, 74960, 87770, 89180, 89181, 89432

Connectors, miscellaneous, Model(s) 35141, 35143, 79909, 94545, 94546

Connectors, miscellanious, Model(s) 87789, 94539

Connectors, pin and socket type, high power, special purpose components, Model(s) 1055, 1261, 1292, 1319, 1360, 1375, 1396, 1461, 1490, 1545, 1554, 1585, 1619, 1625, 1649, 1653, 1770, 1771, 1772, 1776, 1796, 1800, 1801, 1816, 1840, 1843, 1848, 1881, 19-09-5039, 1951, 1991, 2004, 2081, 2107, 2112, 2154, 2156, 2163, 2201, 2298, 2300, 2629, 2687, 2696, 2801, 2894, 30067, 30068, 30069, 30070, 3099, 3191, 3191-3R1-2, 3227, 35108, 35183, 35196-0110, 35204, 35317, 35318, 35959-0300, 35960-0100, 359600-0300, 36538, 36741, 40312, 40750, 41049, 41058, 41196, 41456, 41459, 4154, 42002, 42021, 42022, 42100, 42101, 42102, 42179, 42191, 42208, 42221, 42242, 42348, 42382, 42385, 42390, 42404, 42411, 42416, 42417, 42440, 42450, 42458, 42474, 42475, 42548, 42608, 42641, 42677, 42732, 42733, 42786, 42816, 42818, 42819, 42820, 4283, 43020, 43025, 43045, 4306, 43101, 43106, 43149, 43215, 43232, 43242, 43254, 43255, 43260, 43270, 43274, 43380, 43459, 43460, 43510, 43511, 43512, 43513, 43514, 43515, 43542, 43558, 43640, 43644, 43645, 43650, 43693, 43759, 43760, 43770, 43838, 43839, 43879, 43914, 43915, 43938, 43952, 43953, 43954, 43955, 43973, 43974, 44032, 44033, 44040, 44041, 44129, 44130, 44133, 44151, 44156, 44157, 44300, 44352, 44428, 44432, 44457, 44464, 44472, 44473, 44474, 44475, 44482, 44483, 44499, 44516, 44537, 44540, 44674, 44764, 44769, 44891, 44893, 44914, 44991, 44994, 45280, 45567, 45586, 45587, 45776, 45786, 45938, 45984, 45985, 46010, 46011, 46014, 46015, 46017, 46064, 46065,

46099, 46100, 46101, 46207, 46212, 46214, 46216, 46244, 46500, 46980, 46982, 46985, 46991, 49068, 49388, 49456, 49482, 49483, 49488, 49506, 49559, 49597, 49623, 49624, 49837, 5025, 503193, 503194, 5101, 51011, 51013, 51045, 51046, 51096, 51142, 51157, 51192, 51193, 51194, 51195, 51203, 51204, 51233, 51234, 51235, 51236, 51237, 51238, 51239, 51240, 51241, 51300, 51301, 51446, 51890, 51891, 5190, 52025, 52034, 5209, 52148, 5219, 52556, 5298, 53109, 53111, 53113, 53728, 54293, 54294, 54368, 54370, 54478, 54479, 54927, 54928, 55005, 55117, 55120, 55209, 55211, 55347, 55348, 5557, 5559, 5566, 5569, 55757, 55759, 55890, 55891, 58321@, 58462@, 58466@, 58468@, 6496, 67120, 67219, 6742, 67926, 70156, 70969, 71156, 71231, 71233, 71690, 71694, 75018, 75019, 75126, 75140, 76754, 76755, 76818, 76819, 76833, 76861, 78036, 78037, 78041, 78042, 78043, 78074, 78079, 78086, 78125, 78128, 78143, 78156, 78165, 78166, 78168, 78197, 78294, 78298, 78301, 78302, 78315, 78321, 78370, 78378, 78443, 78916, 87218, 87427, 87527, 87606, 87606-0001, 87607, 87607-001, 87607-0011, 87615, 87615-0001, 87615-0008, 87616, 87616-0001, 87622-8000, 87622-8001, 87622-8002, 87622-8003, 87622-8004, 87631, 87631-8000, 87631-8001, 87631-8002, 87631-8003, 87631-8004, 87631-8008, 87631-8009, 87631-8010, 87631-8011, 87631-8013, 87632, 87632-7001, 87632-8000, 87632-8001, 87632-8009, 87633-8000, 87633-8002, 87633-8003, 87633-8004, 87650, 87658, 87663, 87663-8000, 87664, 87665-0001, 87667, 87668, 87680, 87682, 87684, 87691, 87695-0001, 87696, 87700, 87710, 87734, 87739, 87805, 87806, 87807, 87808, 87874, 87887, 87894, 87921, 87925, 87966, 87987, 8981

Connectors, pin and socket type, high power, special purpose components with optional hardware, Model(s) 58320@

Connectors, sockets for tranducers, transistors, PLCCs, SIPs, DIPs, integrated circuits, Model(s) 41000, 54762, 70969, 71486, 78887, 78888, 78891, 78914, 87088, 87124, 87164, 87246, 89235, 89289

Eurocon connectors, Model(s) MM-Bvxxx-wyxx-zzz, where v is 1 or 2, w is C or R, x is any alphanumeric digit, y is 3, 4 or 9, zzz is blank or any alphanumeric suffix.

Insulation displacement connectors, Model(s) MM-A1xxx-Ayyx or MM-A3x80-Byyx, where yy is any number 06 to 64 and x is any alphanumeric digit.

Low voltage connectors, Model(s) 67023, 89180, 89181 or 89432, followed by A, B, C or E, followed by 09, 15, 25 or 37, followed by P or S, followed by A, B, C or E, followed by 09, 15, 25 or 37, followed by P or S, followed by A, B or C, followed by 4N, 4NJ, 4NR, J or R, followed by A, B or C.

Low voltage connectors, Model(s) 87203, 87204 or 89263, followed by A thru G, followed by 09, 15, 19, 23, 25, 26, 37, 44, 50, 62, 78, followed by 09, 15, 19, 23, 25, 26, 37, 44, 50, 62, 78, followed by P or S, followed by one or two letters, followed by A, B or C.

Low voltage connectors, Model(s) 89290, followed by C or D, followed by 09, 15, 19, 23, 25, 26, 37, 44, 50, 62 or 78, followed by P or S, followed by BR, K, KJ, R or SL, followed by 1, 2, 3 or 4, followed by A, B or C.

Retainer housings, Model(s) 51164

Solar panel connectors, Model(s) 44624, 44625

System connectors, Model(s) 740

Transition type connectors, Model(s) MM-A368-Ayy or MM-B1780-Czzz, where yy is any number 14 to 40 and zzz is any number 060 to 640.

- Followed by 0 through 9, followed by additional suffixes.

@ - Optional hardware for this series

Note - All designations may incorporate prefix and/or suffix numbers and letters. Factory identification code letters ("JXI", "MCH", "MDM", "MHK", "MJC","MJE", "MJN", "MJW", "MK3", "MK2", "MKI", "MSH", "MTH", "MX", "MXA", "MXC", "MXF", "MXG", "MXH", "MXHK", "MXI", "MXJ", "MXJH1", "MXK", "MXL", " MXM", "MXN", "MXO", "MXP", "MXQ", "MXS", "MXS-E", "MXS-E1", "MXT", "MXU", "MXV", "MXY", "TSA, MMP") and series designation on device or carton.

Marking: Company name or tradename "Molex (in a circle)" and model designation.

Last Updated on 2010-05-31

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CONFLICT MINERALS POLICY

1.0 PURPOSE

Molex's Conflict Minerals Policy reflects the commitment of Molex to comply with legal, customer, and industry requirements to ensure Molex does not directly or indirectly engage with suppliers where Molex identifies a reasonable risk that they are sourcing from, or linked to, any party committing human rights or related abuses.

2.0 SCOPE

This policy applies to all Molex entities and all suppliers who provide materials or components that contain tin, tantalum, tungsten, and/or gold that are used in Molex products.

3.0 REFERENCE DOCUMENTS

3.1 DODD-FRANK WALL STREET REFORM AND CONSUMER PROTECTION ACT, SECTION 1502

3.2 OECD DUE DILIGENCE GUIDANCE FOR RESPONSIBLE SUPPLY CHAINS OF MINERALS FROM CONFLICT-AFFECTED AND HIGH-RISK AREAS

3.3 CONFLICT-FREE SOURCING INITIATIVE (CFSI) CONFLICT-FREE SMELTER PROGRAM (CFSP) AND CONFLICT-FREE MINERALS REPORTING TEMPLATE (CMRT)

4.0 DEFINITIONS

4.1 CONFLICT-AFFECTED MINES AND HIGH-RISK AREAS

Conflict-affected mines and high-risk areas are mines or areas identified by the presence of armed conflict, widespread violence, or other risks of harm to people, including the eastern region of the Democratic Republic of the Congo.

4.2 CONFLICT MINERALS

Conflict minerals are columbite-tantalite (coltan), cassiterite, gold, wolframite, or their derivatives, including tin, tantalum, tungsten, and gold.

5.0 POLICY

Molex recognizes that extracting, trading, handling, and exporting minerals (such as columbite-tantalite, cassiterite, gold, wolframite, or their derivatives), from conflict-affected and high-risk areas may lead to human rights or related abuses. As a good corporate citizen, Molex has the responsibility to respect human rights and not contribute to these conflicts. Molex commits to refraining from any action which contributes to the financing of conflict and to comply with relevant United Nations (UN) sanctions resolutions or, where applicable, laws implementing such resolutions.

Molex will neither tolerate nor by any means profit from, contribute to, assist with, or facilitate the payment by any party of the following human rights or related abuses:

- any forms of torture, cruel, inhuman and degrading treatment;
- any forms of forced or compulsory labor;

- child or underage labor;
- other gross human rights violations and abuses;
- war crimes or other serious violations of international humanitarian law, crimes against humanity or genocide.

To achieve these goals, Molex shall:

- implement a due diligence program in accordance with the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas;
- adopt, communicate, and incorporate into contracts and agreements with suppliers the requirement for responsible sourcing of minerals;
- participate in the development of industry initiatives, including CFSI membership;
- review supplier CFSI CMRTs and compare identified smelters/refiners to those verified to be complaint with the CFSI CFSP;
- once applicable, require its supply chain to only use smelters/refiners verified to be compliant with the CFSI CFSP;
- until smelters/refiners are audited and published as compliant, map its supply chain to identify smelters/refiners in the supply chain and require smelters/refiners to participate in the CFSI CFSP;
- where risks are identified, work to improve the supply chain and, where necessary, suspend or discontinue engagement with suppliers where Molex identifies a reasonable risk that they are sourcing from, or linked to, any party committing abuses as defined above;
- provide information about its conflict minerals due diligence program using the CFSI CMRT format and publish additional information about its due diligence program on its website;
- support the responsible sourcing of minerals from the Democratic Republic of the Congo and adjoining countries where the supply chain has been verified to be compliant with the CFSI CFSP.

5.1 SUPPLIER RESPONSIBILITIES

Molex suppliers who provide materials or components that contain tin, tantalum, tungsten, and/or gold that are used in Molex products shall:

- create a conflict minerals policy and provide it to Molex;
- implement a due diligence program in accordance with the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas;
- provide a completed CFSI CMRT at least annually;
- proactively provide updates to Molex when changes to information in the CFSI CMRT occur.

6.0 IMPLEMENTATION

This policy is effective immediately.

7.0 REVISION HISTORY

Revision	Date	Description
A	2011/10/24	Initial release
B	2013/11/15	Revisions throughout to align policy with guidance and industry standards Modified from QEHS Policy to Social Responsibility Policy Renumbered from QEHS-699000-009 to CSR-699010-005

Ecocare

- EH&S Policy
- Policy In Action
- Operations Management
- Product Compliance
- Position Statements
- Supply Chain Mgmt
- FAQ's
- Sustainability Blog
- Social Responsibility

Supply Chain Management

Molex Supplier Code of Conduct

Molex has a Code of Conduct for its suppliers and expects them to comply with this code in its business dealings. Where a supplier uses a subcontractor to work on components or materials supplied to Molex, the expectation is that the supplier has issued this Code of Conduct to the subcontractor and that this subcontractor also complies with this code.

Suppliers must be familiar with the Molex Code of Business Conduct and Ethics located on the "About Us" section or the Molex extranet (molex.com) and abide by this policy where appropriate.

Code of Conduct for Suppliers

The California Transparency in Supply Chains Act of 2010

Molex is committed to upholding the human rights of workers and treating them with dignity and respect. Our commitment includes adhering to and recognizing the critical importance of standards regarding freely chosen employment, child labor, discrimination, health and safety, harsh or inhumane treatment, minimum wages, and working hours. Molex has taken multiple actions to verify and ensure the absence of forced labor, slavery and human trafficking in our supply chain. Please click here to learn more.

Molex Chemical Substances Specification For Products and Packaging: For Customers (QEHS-699000-301)

This specification covers the product environmental information required from Molex suppliers who supply Products, Sub-Assemblies, Components, and Materials that are present in Molex products. This specification:

- Includes definitions for numerous terms that are used to describe product and packaging environmental requirements.
- Describes the environmental information Molex will collect from suppliers and provide to customers.
- Describes Bill of Substance, Declaration of Non-Use, and Substance Testing requirements for products.
- Defines the environmental compliance requirements for packaging.
- Lists specific substance limits and thresholds.

Click here to download a copy of the Molex Chemical Substances Specification For Products and Packaging: For Customers (QEHS-699000-301)

Conflict Minerals

Being a socially responsible company in our global community is very important to Molex. We are committed to fully complying with the laws, rules and regulations of the countries in which we operate. We are also committed to

continually evaluating our business practices in light of the values and principles that are important to us, taking int consideration the interests of our customers, shareholders, employees, suppliers and the communities in which we work and live.

One area of concern within the electronics industry is the mining of minerals from conflict-affected areas, primarily the Democratic Republic of the Congo (DRC), where the presence of armed conflict and human rights abuses exist. Molex, like many in the electronics industry, uses certain types of metals, (gold, tin, tantalum, and tungsten) some o which are potentially derived from minerals obtained from the conflict-affected areas in the DRC.

As an electronics manufacturer, Molex uses gold and tin (and occasionally tantalum and tungsten) in the products we produce. We have adopted a management system approach regarding the supply chain of minerals from conflict affected areas based on the Organization of Economic Co-operation and Development (OECD) Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas (OECD Due Diligence Guidance)

Due Diligence

Molex is a member of the Conflict-Free Sourcing Initiative (CFSI). The CFSI is one of the most utilized and respected resources for companies from a range of industries addressing conflict minerals issues in their supply chain.

Molex's conflict minerals policy commits Molex to compliance with legal, customer, and industry requirements to ensure Molex does not directly or indirectly engage with suppliers where Molex identifies a reasonable risk that they are sourcing from, or linked to, any party committing human rights or related abuses.

Molex's Conflict Minerals Policy is available here.

Molex's due diligence program is designed to conform with the OECD Due Diligence Guidance. Molex's Conflict Minerals Policy has been communicated to all relevant suppliers, who are expected to provide a completed Conflict-Free Sourcing Initiative (CFSI) Conflict Minerals Reporting Template (CMRT) at least annually and identify upstream smelters and refiners.

Additional details about Molex's conflict minerals due diligence program can be found in our Conflict Minerals Report for the year ending December 31, 2013.

Customers may request Molex's CMRT from ProductCompliance@molex.com.

Molex Incorporated
Conflict Minerals Report
For The Year Ended December 31, 2013

This Conflict Minerals Report for Molex Incorporated ("Molex," "we," or "our") has been prepared covering the reporting period of calendar year 2013. Companies in scope of the United States ("US") Dodd-Frank Wall Street Reform and Consumer Protection Act ("Act") must file Form SD and potentially a Conflict Minerals Report with the US Securities and Exchange Commission ("SEC"). Molex is not in scope of the Act. However, in an effort to be transparent, Molex created this Conflict Minerals Report following the guidance outlined in the Act and OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas ("OECD Due Diligence Guidance").

Introduction

Molex has determined that tin, tantalum, tungsten, and gold ("3TG") are necessary to the functionality or production of certain manufactured products. Molex performed a Reasonable Country of Origin Inquiry ("RCOI") to determine whether any of the conflict minerals originated in the Democratic Republic of the Congo ("DRC") or an adjoining country ("covered countries"), or are from recycled or scrap sources. Molex included all suppliers that supply raw materials or components that contain, or potentially contain, tin, tantalum, tungsten, or gold that are used in Molex's products. Suppliers that provided clear documentation indicating that supplied raw materials or components do not contain tin, tantalum, tungsten, or gold were excluded from further activities. Molex requested suppliers complete the Conflict-Free Sourcing Initiative ("CFSI") Conflict Minerals Reporting Template ("CMRT") and list smelters and refiners in the supply chain, including country of origin, where available.

Based on the RCOI, Molex determined necessary conflict minerals in the supply chain originated in the Democratic Republic of the Congo and adjoining countries and are not all from recycled or scrap sources. Therefore, Molex exercised due diligence on the source and chain of custody of tin, tantalum, tungsten, and gold. Molex's due diligence program was designed in conformance with the OECD Due Diligence Guidance. This publicly-available Conflict Minerals Report is a part of Molex's due diligence program.

Design of Due Diligence

Molex's conflict minerals due diligence program was designed to conform, in all material respects, with the OECD Due Diligence Guidance, which is a five-step framework for risk-based due diligence. The steps, and actions Molex took, are described below.

Due Diligence Performed

1. Establish strong company management systems

We adopted and published a conflict minerals policy that commits Molex to compliance with legal, customer, and industry requirements to ensure Molex does not directly or indirectly engage with suppliers where Molex identifies a reasonable risk that they are sourcing from, or linked to, any party committing human rights or related abuses in the covered countries. The policy also requires suppliers to implement a due diligence program in accordance with the OECD Due Diligence Guidance and provide a CFSI CMRT at least annually. This policy was communicated internally, to suppliers, and published on

our website at www.molex.com/ecocare/SupplyChainMgmt. Molex's policy lists internal responsibilities and supplier responsibilities. We also improved our contractual obligations by modifying our code of conduct for suppliers to reference the policy.

Molex established a conflict minerals team with representation from functions including information technology, legal, procurement, and quality, environmental, healthy, and safety. Molex created procedures to contact suppliers and collect CFSI CMRTs, which allow suppliers to identify smelters and refiners in Molex's supply chain. This data is collected and managed in a computer database.

Molex utilizes a secure, confidential system operated by an independent third party to allow interested parties to raise concerns about potential unethical or illegal conduct or to ask questions about Molex's Code of Business Conduct and Ethics. This system allows employees, contract workers, independent contractors, subcontractors, agents, suppliers, and customers to report any concerns related to conflict minerals.

2. Identify and assess risks in the supply chain

As a downstream company, Molex does not have a direct business relationship with smelters and refiners, and therefore relies on its direct suppliers to identify smelters and refiners in the supply chain. To do so, Molex requested CFSI CMRTs from all relevant suppliers based on the classification of materials and components provided by each supplier. Suppliers of materials or components that contain tin, tantalum, tungsten, or gold that are used in Molex products are expected to identify upstream smelters and refiners using the CFSI CMRT format or an online survey tool.

The CFSI Conflict-Free Smelting Program ("CFSP") manages an audit program for smelters and refiners. Smelters and refiners that have successfully completed an audit are published on the CFSI website as compliant (conflict-free). In addition, smelters and refiners that are not published as conflict-free can voluntarily disclose they are active in the audit program on the CFSI website. We compared the smelters and refiners identified by suppliers to these lists to identify legitimate and conflict-free smelters and refiners.

3. Design and implement a strategy to respond to identified risks

Periodic program updates are reported to senior management. This reporting includes the smelters and refiners identified in Molex's supply chain and identified risks. An escalation process was created to manage suppliers that did not respond or provided incomplete information.

4. Carry out independent third-party audit of smelter/refiner's due diligence practices

Molex is a member of the CFSI and relies on the CFSI CFSP to plan and manage an audit program and provide country of origin information. Molex, either directly or indirectly through suppliers, encouraged smelters and refiners to participate in the audit program.

5. Report annually on supply chain due diligence

This report was created to publicly disclose information about Molex's conflict minerals due diligence program. This report can be found on our website at www.molex.com/ecocare/SupplyChainMgmt.

Steps to Improve Due Diligence

Molex is performing, or intends to perform, the following steps to mitigate the risk that its tin, tantalum, tungsten, and gold purchases benefit armed groups:

- Continue to collect and review CMRTs, including smelter and refiner identification.
- Continue to encourage smelters and refiners to participate in the CFSI CFSP.
- Encourage suppliers to use smelters and refiners committed to participation in the CFSI CFSP.
- Continue our participation in the CFSI and its working groups.

Product Description

We performed the due diligence described and were unable to identify the origin of all the conflict minerals used in products manufactured in 2013.

Suppliers reported 62 verified smelters and refiners (facilities) in the supply chain that processed tin, tantalum, and gold and have been published as compliant (conflict-free) by the CFSI. 6 of these smelters are known to source from the covered countries. Suppliers reported an additional 97 smelters and refiners (facilities) in the supply chain that processed tin, tantalum, tungsten, and gold that have not been published as compliant (conflict-free) by the CFSI.

Molex's current CMRT, which includes the current list of smelters and refiners in Molex's supply chain, can be requested via ProductCompliance@molex.com.

6.

電子線材規格表
SGS報告書

廣雄實業有限公司

規格書

UL Style 1571 80℃ 30V PVC/SRPVC 電子線

▲產品說明

- 導體使用單條或絞線,裸銅或鍍錫銅
- PVC 絕緣,28AWG 以上絕緣外表不印字
- 額定溫度:80℃額定電壓:30Volts
- 使用標準厚度，易剝，截斷容易
- 可通過 UL VW-1，垂直耐燃試驗

▲應用

- 電子設備二次迴路中內部連接用線

▲構造圖

▲規格表

項目	規格	備註
線號	28AWG	
額定溫度	80℃	
額定電壓	30V	
導體構成	7/0.127mm	
導體材質	軟銅鍍錫絞線	
導體外徑	0.39mm	
絕緣體材質	SR-PVC	
絕緣體厚度	0.23mm	
絕緣體外徑	0.85±0.05mm	
最大導體電阻	248Ω/Km	
容許電流	1.60A	
最小絕緣電阻	15MΩ/Km	
絕緣耐壓	500VAC/min	

Signature Not Verified
For Question Please
Contact with SGS
www.sgs.com.tw

測試報告
Test Report

號碼(No.): CC/2018/30158B　日期(Date): 2019/02/23　

富岡實業有限公司
FUH GANG INDUSTRIAL CO., LTD.
新北市鶯歌區二甲路83之9號
NO. 83-9, EAY CAH RD., YING KO DIST., NEW TAIPEI CITY, 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/on behalf of the applicant as):

送樣廠商(Sample Submitted By)	:	富岡實業有限公司 (FUH GANG INDUSTRIAL CO., LTD.)
樣品名稱(Sample Description)	:	BLACK PVC PELLET
收件日期(Sample Receiving Date)	:	2018/03/14
測試期間(Testing Period)	:	2018/03/14 to 2018/03/21 and 2018/06/28 to 2018/07/31 and 2019/01/16 to 2019/02/23

==========

測試需求(Test Requested) : 依據客戶指定，參考REACH之Regulation (EC) No 1907/2006的公告進行以下測試 / As specified by client, the sample(s) was/were tested with reference to Regulation (EC) No 1907/2006 concerning the REACH.
■ 197項高關注物質候選清單，於2019年01月15日公告 / 197 Substances of Very High Concern (SVHC). Candidate list is published on 2019 January 15

測試結果(Test Results) : 請見下一頁 (Please refer to next pages).

總結(Summary) : 根據歐洲法院對於REACH規範下成品定義的裁決以及指定範圍和分析技術，送測樣品中所選擇的零部件成品的高關注物質(SVHC) 測試結果濃度均小於0.1%(w/w) / According to the ruling of the Court of Justice of the European Union on the definition of an article under REACH, and the specified scope as well as analytical technique, the test results of the selected component article are ≤ 0.1% (w/w) in the submitted sample(s).

* 此份報告為加測CC/2018/30158及合併CC/2018/30158A之報告 *
(This report is added testing by CC/2018/30158 and combined with CC/2018/30158A)

SGS TAIWAN LTD

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

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測試報告
Test Report

富岡實業有限公司
FUH GANG INDUSTRIAL CO., LTD.
新北市鶯歌區二甲路83之9號
NO. 83-9, EAY CAH RD., YING KO DIST., NEW TAIPEI CITY, TAIWAN

測試樣品(Test Sample): 黑色塑膠粒 (BLACK PLASTIC PELLETS)

測試方法(Test Method):

由感應耦合電漿原子發射光譜儀、紫外光可見光譜儀、氣相層析/質譜儀、液相層析/質譜儀、氣相層析儀/火焰光度偵測器、液相層析/質譜儀/二極體陣列偵測器、超高效能液相層析串聯質譜儀進行分析。/ SGS In-House method-RSTS-EE-SVHC-007. Analyzed by ICP-AES, UV-VIS, GC/MS, LC/MS, GC/FPD, LC/MS/DAD, UPLC-MSMS.

測試結果 (Test Results)

No.	物質名稱 (Substance Name)	RL (%)	濃度 (Concentration) (%)
1.	4,4' - 二氨基二苯甲烷 / 4,4' - Diaminodiphenylmethane (MDA) (CAS No.: 101-77-9)	0.05	n.d.
2.	二甲苯麝香 / 5-tert-butyl-2,4,6-trinitro- m-xylene (Musk Xylene) (CAS No.: 81-15-2)	0.05	n.d.
3.	短鏈氯化石蠟 / Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins) (CAS No.: 85535-84-8)	0.05	n.d.
4.	蒽 / Anthracene (CAS No.: 120-12-7)	0.05	n.d.
5.	鄰苯二甲酸丁苯甲酯 / BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	0.05	n.d.
6.	氧化雙三丁基錫 / Bis(tributyltin)oxide (TBTO)*** (CAS No.: 56-35-9)	-	n.d.
7.	五氧化二砷 / Diarsenic pentaoxide*** (CAS No.: 1303-28-2)	-	n.d.
8.	三氧化二砷 / Diarsenic trioxide*** (CAS No.: 1327-53-3)	-	n.d.
9.	鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	0.05	n.d.
10.	六溴環十二烷及所有主要被辨別出的異構物 / Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α- HBCDD, β- HBCDD, γ- HBCDD) (CAS No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	0.05	n.d.
11.	砷酸氫鉛 / Lead hydrogen arsenate*** (CAS No.: 7784-40-9) (※1)	-	n.d.
12.	重鉻酸鈉 / Sodium dichromate*** (CAS No.: 7789-12-0; 10588-01-9(*))	-	n.d.
13.	三乙基砷酸酯 / Triethyl arsenate*** (CAS No.: 15606-95-8)	-	n.d.
14.	鄰苯二甲酸二 (2-乙基己基)酯 / DEHP (Bis (2-ethyl(hexyl) phthalate)) (CAS No.: 117-81-7)	0.05	n.d.
15.	2,4-二硝基甲苯 / 2,4-Dinitrotoluene (CAS No.: 121-14-2)	0.05	n.d.
16.	蒽油 / Anthracene oil (CAS No.: 90640-80-5) (**)	0.05	n.d.
17.	蒽油, 蒽糊 / Anthracene oil, anthracene paste (CAS No.: 90640-81-6) (**)	0.05	n.d.
18.	蒽油, 蒽糊, 蒽餾分 / Anthracene oil, anthracene paste, anthracene fraction (CAS No.: 91995-15-2) (**)	0.05	n.d.

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No.	物質名稱 (Substance Name)	RL (%)	濃度 (Concentration) (%)
19.	蒽油, 蒽糊, 輕油 / Anthracene oil, anthracene paste, distn. Lights (CAS No.: 91995-17-4) (**)	0.05	n.d.
20.	蒽油, 含蒽量少 / Anthracene oil, anthracene-low (CAS No.: 90640-82-7) (**)	0.05	n.d.
21.	鄰苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	0.05	n.d.
22.	鉻酸鉛 / Lead chromate*** (CAS No.: 7758-97-6) (※5)	-	n.d.
23.	鉬鉻紅；顏色索引: 顏料紅104 / Lead chromate molybdate sulphate red*** (C.I. Pigment Red 104) (CAS No.: 12656-85-8) (※5)	-	n.d.
24.	鉻酸鉛；顏色索引: 顏料黃34 / Lead sulfochromate yellow*** (C.I. Pigment Yellow 34) (CAS No.: 1344-37-2) (※5)	-	n.d.
25.	煤瀝青, 高溫 / Pitch, coal tar, high-temp. (CAS No.: 65996-93-2) (**)	0.05	n.d.
26.	磷酸三 (2-氯乙基)酯 / Tris(2-chloroethyl) phosphate (TCEP) (CAS No.: 115-96-8)	0.05	n.d.
27.	丙烯醯胺 / Acrylamide (CAS No.: 79-06-1)	0.05	n.d.
28.	重鉻酸銨 / Ammonium dichromate*** (CAS No.: 7789-09-5)	-	n.d.
29.	硼酸 / Boric acid*** (CAS No.: 10043-35-3; 11113-50-1)	-	n.d.
30.	無水四硼酸二鈉 / Disodium tetraborate, anhydrous*** (CAS No.: 1303-96-4, 1330-43-4, 12179-04-3)	-	n.d.
31.	鉻酸鉀 / Potassium chromate*** (CAS No.: 7789-00-6)	-	n.d.
32.	重鉻酸鉀 / Potassium dichromate*** (CAS No.: 7778-50-9)	-	n.d.
33.	鉻酸鈉 / Sodium chromate*** (CAS No.: 7775-11-3)	-	n.d.
34.	水合硼酸鈉 / Tetraboron disodium heptaoxide, hydrate (CAS No.: 12267-73-1) (*2)	-	n.d.
35.	三氯乙烯 / Trichloroethylene (CAS No.: 79-01-6)	0.05	n.d.
36.	乙二醇乙醚 / 2-Ethoxyethanol (CAS No.: 110-80-5)	0.05	n.d.
37.	乙二醇甲醚 / 2-Methoxyethanol (CAS No.: 109-86-4)	0.05	n.d.
38.	從三氧化鉻與其它寡聚體生成的酸類: 鉻酸 / Acids generated from chromium trioxide and their oligomers: Chromic acid*** (CAS No.: 7738-94-5)	-	n.d.
	從三氧化鉻與其它寡聚體生成的酸類: 重鉻酸 / Acids generated from chromium trioxide and their oligomers: Dichromic acid*** (CAS No.: 13530-68-2)	-	n.d.
	從三氧化鉻與其它寡聚體生成的酸類: 鉻酸與重鉻酸的寡聚體 / Acids generated from chromium trioxide and their oligomers: Oligomers of chromic acid and dichromic acid (*1)	-	n.d.
39.	三氧化鉻 / Chromium trioxide ***(CAS No.: 1333-82-0)	-	n.d.

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No.	物質名稱 (Substance Name)	RL (%)	濃度 (Concentration) (%)
40.	碳酸鈷(二價) / Cobalt(II) carbonate*** (CAS No.: 513-79-1)	-	n.d.
41.	醋酸鈷(二價) / Cobalt(II) diacetate*** (CAS No.: 71-48-7)	-	n.d.
42.	硝酸鈷(二價) / Cobalt(II) dinitrate*** (CAS No.: 10141-05-6)	-	n.d.
43.	硫酸鈷(二價) / Cobalt(II) sulphate*** (CAS No.: 10124-43-3)	-	n.d.
44.	1,2,3-三氯丙烷 / 1,2,3-trichloropropane (CAS No.: 96-18-4)	0.05	n.d.
45.	鄰苯二甲酸二 (C6-8支鏈)烷基酯，富C7 / 1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP) (CAS No.: 71888-89-6)	0.05	n.d.
46.	鄰苯二甲酸二 (C7-11支鏈與直鏈)烷基酯 / 1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP) (CAS No.: 68515-42-4)	0.05	n.d.
47.	N-甲基吡咯烷酮 / 1-methyl-2-pyrrolidone (CAS No.: 872-50-4)	0.05	n.d.
48.	乙二醇乙醚乙酸酯 / 2-ethoxyethyl acetate (CAS No.: 111-15-9)	0.05	n.d.
49.	聯氨 / Hydrazine (CAS No.: 7803-57-8; 302-01-2)	0.05	n.d.
50.	鉻酸鍶 / Strontium chromate*** (CAS No.: 7789-06-2)	-	n.d.
51.	二氯化鈷 / Cobalt dichloride (CAS No.: 7646-79-9)	0.005	n.d.
52.	1,2-二氯乙烷 / 1,2-Dichloroethane (CAS No.: 107-06-2)	0.05	n.d.
53.	4,4'-亞甲雙 (2-氯苯胺) / 2,2'-dichloro- 4,4'-methylenedianiline (MOCA) (CAS No.: 101-14-4)	0.05	n.d.
54.	鄰甲氧基苯胺 / 2-Methoxyaniline; o-Anisidine (CAS No.: 90-04-0)	0.05	n.d.
55.	對特辛基苯酚 / 辛基酚 / 4-(1,1,3,3-tetramethylbutyl) phenol, (4-tert-Octylphenol) (CAS No.: 140-66-9)	0.05	n.d.
56.	矽酸鋁，耐火陶瓷纖維 (主要成分濃度於可變範圍內) / Aluminosilicate, Refractory Ceramic Fibres【oxides of aluminium and silicon are the main components present (in the fibres) within variable concentration ranges】	0.05	n.d.
57.	砷酸 / Arsenic acid*** (CAS No.: 7778-39-4)	-	n.d.
58.	双(2-甲氧基乙基)醚 / Bis(2-methoxyethyl) ether (CAS No.: 111-96-6)	0.05	n.d.
59.	鄰苯二甲酸二甲氧基乙酯 / Bis(2-methoxyethyl) phthalate (CAS No.: 117-82-8)	0.05	n.d.
60.	砷酸鈣 / Calcium arsenate*** (CAS No.: 7778-44-1)	-	n.d.
61.	鉻酸鉻 / Dichromium tris (chromate)*** (CAS No.: 24613-89-6)	-	n.d.
62.	甲醛與苯胺的寡聚體 / Formaldehyde, oligomeric reaction products with aniline (technical MDA) (CAS No.: 25214-70-4)	0.05	n.d.

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No.	物質名稱 (Substance Name)	RL (%)	濃度 (Concentration) (%)
63.	疊氮化鉛 / Lead diazide, Lead azide*** (CAS No.: 13424-46-9)	-	n.d.
64.	苦味酸鉛 / Lead dipicrate*** (CAS No.: 6477-64-1)	-	n.d.
65.	中性斯蒂酚酸鉛 / Lead styphnate*** (CAS No.: 15245-44-0)	-	n.d.
66.	N,N-二甲基乙醯胺 / N,N-dimethylacetamide (DMAC) (CAS No.: 127-19-5)	0.05	n.d.
67.	八氫氧化五鉻酸鋅 / Pentazinc chromate octahydroxide*** (CAS No.: 49663-84-5)	-	n.d.
68.	酚酞 / Phenolphthalein (CAS No.: 77-09-8)	0.05	n.d.
69.	氫氧化鉻酸鋅鉀 / Potassium hydroxyoctaoxodizincatedi- chromate*** (CAS No.: 11103-86-9)	-	n.d.
70.	砷酸鉛 / Trilead diarsenate*** (CAS No.: 3687-31-8) (※1)	-	n.d.
71.	鋯矽酸鋁，耐火陶瓷纖維（主要成分濃度於可變範圍內）/ Zirconia Aluminosilicate, Refractory Ceramic Fibres 【oxides of aluminium, silicon and zirconium are the main components present (in the fibres) within variable concentration ranges】	0.05	n.d.
72.	鹼性藍 26 [內含≥ 0.1% 的米氏酮或米氏鹼] / [4-[[4-anilino-1-naphthyl] [4-(dimethylamino) phenyl] methylene] cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Blue 26) (CAS No.: 2580-56-5) [with ≥ 0.1% of Michler's ketone or Michler's base]	0.05	n.d.
73.	鹼性紫 3 [內含≥ 0.1% 的米氏酮或米氏鹼] / [4-[4,4'-bis(dimethylamino) benzhydrylidene] cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Violet 3) (CAS No.: 548-62-9) [with ≥ 0.1% of Michler's ketone or Michler's base]	0.05	n.d.
74.	三甘醇二甲醚 / 1,2-bis (2-methoxyethoxy) ethane (TEGDME; triglyme) (CAS No.: 112-49-2)	0.05	n.d.
75.	乙二醇二甲醚 / 1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME) (CAS No.: 110-71-4)	0.05	n.d.
76.	異氰尿酸三縮水甘油酯 / TGIC (1,3,5-tris(oxiranylmethyl)- 1,3,5-triazine-2,4,6 (1H,3H,5H)-trione) (CAS No.: 2451-62-9)	0.05	n.d.
77.	異氰尿酸β-三縮水甘油酯 / β-TGIC (1,3,5-tris [(2S and 2R)-2,3-epoxypropyl]-1,3,5-triazine-2,4,6- (1H,3H,5H)-trione) (CAS No.: 59653-74-6) (※3)	0.05	n.d.
78.	α, α-二[(二甲氨基)苯基]-4-甲氨基苯甲醇 [內含≥ 0.1% 的米氏酮或米氏鹼] / 4,4'-bis (dimethylamino)-4''-(methylamino) trityl alcohol (CAS No.: 561-41-1) [with ≥ 0.1% of Michler's ketone or Michler's base]	0.05	n.d.

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79.	4,4'-二(N,N-二甲氨基)二苯甲酮 (米氏酮) / 4,4'-bis (dimethylamino) benzophenone (Michler's ketone) (CAS No.: 90-94-8)	0.05	n.d.
80.	三氧化二硼 / Diboron trioxide*** (CAS No.: 1303-86-2)	-	n.d.
81.	甲醯胺 / Formamide (CAS No.: 75-12-7)	0.05	n.d.
82.	甲基磺酸鉛 / Lead(II) bis(methanesulfonate)*** (CAS No.: 17570-76-2)	-	n.d.
83.	4,4'-(对二甲氨基)二苯基甲烷 (米氏鹼) / N,N,N',N'-tetramethyl- 4,4'-methylenedianiline (Michler's base) (CAS No.: 101-61-1)	0.05	n.d.
84.	溶劑藍 4 [內含≥ 0.1% 的米氏酮或米氏鹼] / α,α-Bis[4-(dimethylamino) phenyl]-4 (phenylamino) naphthalene-1-methanol (C.I. Solvent Blue 4) (CAS No.: 6786-83-0) [with ≥ 0.1% of Michler's ketone or Michler's base]	0.05	n.d.
85.	[1,2-苯二羧酸根合]二氧化三鉛 / [Phthalato(2-)] dioxotrilead*** (CAS No.: 69011-06-9)	-	n.d.
86.	支鏈和直鏈1,2-苯二羧二戊酯 / 1,2-Benzenedicarboxylic acid, dipentylester, branched and linear (CAS No.: 84777-06-0)	0.05	n.d.
87.	乙二醇二乙醚 / 1,2-Diethoxyethane (CAS No.: 629-14-1)	0.05	n.d.
88.	正丙基溴 / 1-bromopropane (CAS No.: 106-94-5)	0.05	n.d.
89.	3-乙基-2-甲基-2-(3-甲基丁基)-1,3-惡唑烷 / 3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine (CAS No.: 143860-04-2)	0.05	n.d.
90.	4-(1,1,3,3-四甲基丁基)苯酚, 乙氧基 [以及所有的被定義的物質，未知成分或可變成分的物質，聚合物和同系物] / 4-(1,1,3,3-tetramethylbutyl) phenol, ethoxylated [covering well-defined substances and UVCB substances, polymers and homologues]	0.05	n.d.
91.	4,4'-二氨基-3,3'-二甲基聯苯基甲烷 / 4,4'-methylenedi-o-toluidine (CAS No.: 838-88-0)	0.05	n.d.
92.	4,4'-二氨基二苯醚 / 4,4'-oxydianiline and its salts (CAS No.: 101-80-4)	0.05	n.d.
93.	4-苯基偶氮基苯胺 / 4-Aminoazobenzene (CAS No.: 60-09-3)	0.05	n.d.
94.	2,4-二氨基甲苯 / 4-methyl-m-phenylenediamine (2,4-toluenediamine) (CAS No.: 95-80-7)	0.05	n.d.
95.	分支或線性的壬基酚，包括含有9個碳烷基鏈的所有獨立的同分異構體和所有含有線性或分支9個碳烷基鏈的UVCB物質 / 4-Nonylphenol, branched and linear [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof]	0.05	n.d.

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96.	3-甲基-6-甲氧基苯胺 / 6-methoxy-m-toluidine (p-cresidine) (CAS No.: 120-71-8)	0.05	n.d.
97.	堿式醋酸鉛 / Acetic acid, lead salt, basic*** (CAS No.: 51404-69-4)	-	n.d.
98.	4-胺基聯苯 / Biphenyl-4-ylamine (CAS No.: 92-67-1)	0.05	n.d.
99.	十溴聯苯醚 / Bis(pentabromophenyl) ether (DecaBDE) (CAS No.: 1163-19-5)	0.05	n.d.
100.	六氫苯二甲酸酐 / Cyclohexane-1,2-dicarboxylic anhydride (HHPA), cis-cyclohexane-1,2- dicarboxylic anhydride, trans-cyclohexane-1,2- dicarboxylic anhydride (Hexahydrophthalic anhydride - HHPA) (CAS No.: 85-42-7, 13149-00-3, 14166-21-3)	0.05	n.d.
101.	偶氮[二]甲醯胺 / Diazene-1,2-dicarboxamide (C,C'-azodi(formamide)) (CAS No.: 123-77-3)	0.05	n.d.
102.	二氯二丁基錫 / Dibutyltin dichloride (DBTC)*** (CAS No.: 683-18-1)	-	n.d.
103.	硫酸二乙酯 / Diethyl sulphate (CAS No.: 64-67-5)	0.05	n.d.
104.	鄰苯二甲酸二異戊酯 / Diisopentylphthalate (CAS No.: 605-50-5)	0.05	n.d.
105.	硫酸二甲酯 / Dimethyl sulphate (CAS No.: 77-78-1)	0.05	n.d.
106.	2-(1-甲基丙基)-4,6-二硝基苯酚 / Dinoseb (CAS No.: 88-85-7)	0.05	n.d.
107.	雙(十八酸基)二氧代三鉛 / Dioxobis(stearato) trilead*** (CAS No.: 12578-12-0)	-	n.d.
108.	C16-18-脂肪酸鉛鹽 / Fatty acids, C16-18, lead salts*** (CAS No.: 91031-62-8)	-	n.d.
109.	呋喃 / Furan (CAS No.: 110-00-9)	0.05	n.d.
110.	全氟十一酸 / Henicosafluoroundecanoic acid (CAS No.: 2058-94-8)	0.05	n.d.
111.	全氟十四酸 / Heptacosafluorotetradecanoic acid (CAS No.: 376-06-7)	0.05	n.d.
112.	甲基六氫苯酐 / Hexahydromethylphathalic anhydride (CAS No.: 25550-51-0) 4-甲基六氫苯酐 / Hexahydro-4-methylphathalic anhydride (CAS No.: 19438-60-9) 1-甲基六氫苯酐 / Hexahydro-1-methylphathalic anhydride (CAS No.: 48122-14-1) 3-甲基六氫苯酐 / Hexahydro-3-methylphathalic anhydride (CAS No.: 57110-29-9)	0.05	n.d.
113.	四氟硼酸鉛 (II) / Lead bis(tetrafluoroborate)*** (CAS No.: 13814-96-5)	-	n.d.
114.	氨基氰鉛鹽 / Lead cyanamidate*** (CAS No.: 20837-86-9)	-	n.d.
115.	硝酸鉛 / Lead dinitrate*** (CAS No.: 10099-74-8)	-	n.d.
116.	氧化鉛 / Lead oxide (lead monoxide)*** (CAS No.: 1317-36-8)	-	n.d.
117.	堿式硫酸鉛 / Lead oxide sulfate*** (CAS No.: 12036-76-9)	-	n.d.
118.	鈦酸鉛 / Lead titanium trioxide*** (CAS No.: 12060-00-3)	-	n.d.
119.	鈦酸鉛鋯 / Lead Titanium Zirconium Oxide*** (CAS No.: 12626-81-2)	-	n.d.

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No.	物質名稱 (Substance Name)	RL (%)	濃度 (Concentration) (%)
120.	甲氧基乙酸 / Methoxy acetic acid (CAS No.: 625-45-6)	0.05	n.d.
121.	環氧丙烷 / Propylene oxide; 1,2-epoxypropane; methyloxirane (CAS No.: 75-56-9)	0.05	n.d.
122.	N,N-二甲基甲醯胺 / N,N-dimethylformamide; dimethyl formamide (CAS No.: 68-12-2)	0.05	n.d.
123.	N-甲基乙醯胺 / N-methylacetamide (CAS No.: 79-16-3)	0.05	n.d.
124.	鄰苯二甲酸正戊異戊酯 / N-pentyl-isopentylphtalate (CAS No.: 776297-69-9)	0.05	n.d.
125.	鄰氨基偶氮甲苯 / o-aminoazotoluene (CAS No.: 97-56-3)	0.05	n.d.
126.	四氧化鉛 / Lead tetroxide (orange lead)*** (CAS No.: 1314-41-6)	-	n.d.
127.	鄰甲苯胺 / o-Toluidine; 2-Aminotoluene (CAS No.: 95-53-4)	0.05	n.d.
128.	全氟十三酸 / Pentacosafluorotridecanoic acid (CAS No.: 72629-94-8)	0.05	n.d.
129.	氧化鉛與硫酸鉛的複合物 / Pentalead tetraoxide sulphate*** (CAS No.: 12065-90-6)	-	n.d.
130.	C.I.顏料黃41 / Pyrochlore, antimony lead yellow*** (CAS No.: 8012-00-8)	-	n.d.
131.	含鉛的矽酸鋇 / Silicic acid, barium salt, lead-doped (※4) (CAS No.: 68784-75-8)	0.05	n.d.
132.	矽酸鉛 / Silicic acid, lead salt*** (CAS No.: 11120-22-2)	-	n.d.
133.	亞硫酸鉛(II) / Sulfurous acid, lead salt, dibasic*** (CAS No.: 62229-08-7)	-	n.d.
134.	四乙基鉛 / Tetraethyllead*** (CAS No.: 78-00-2)	-	n.d.
135.	三鹼式硫酸鉛/ C.I. 顏料白 / Tetralead trioxide sulphate*** (CAS No.: 12202-17-4)	-	n.d.
136.	全氟十二酸 / Tricosafluorododecanoic acid (CAS No.: 307-55-1)	0.05	n.d.
137.	堿式碳酸鉛 / Trilead bis(carbonate) dihydroxide (basic lead carbonate)*** (CAS No.: 1319-46-6)	-	n.d.
138.	磷酸氧化鉛 / Trilead dioxide phosphonate*** (CAS No.: 12141-20-7)	-	n.d.
139.	分支或線性的乙氧化壬基酚，包括含有9個碳烷基鏈的所有獨立的同分異構體和所有含有線性或分支9個碳烷基鏈的UVCB物質 / 4-Nonylphenol, branched and linear, ethoxylated [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, ethoxylated covering UVCB- and well-defined substances, polymers and homologues, which include any of the individual isomers and/or combinations thereof]	0.05	n.d.
140.	全氟辛酸銨 / Ammoniumpentadecafluorooctanoate (APFO)*** (CAS No.: 3825-26-1)	-	n.d.
141.	鎘 / Cadmium (Cd) (CAS No.: 7440-43-9)	0.005	n.d.
142.	氧化鎘 / Cadmium oxide*** (CAS No.: 1306-19-0)	-	n.d.
143.	鄰苯二甲酸二戊酯 / Dipentyl phthalate (CAS No.: 131-18-0)	0.05	n.d.
144.	全氟辛酸 / Pentadecafluorooctanoic acid (PFOA) (CAS No.: 335-67-1)	0.05	n.d.
145.	硫化鎘 / Cadmium sulphide*** (CAS No.: 1306-23-6)	-	n.d.

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No.	物質名稱 (Substance Name)	RL (%)	濃度 (Concentration) (%)
146.	鄰苯二甲酸二己酯 / Dihexyl phthalate (CAS No.: 84-75-3)	0.05	n.d.
147.	直接紅28 / Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate) (C.I. Direct Red 28) (CAS No.: 573-58-0)	0.05	n.d.
148.	直接黑38 / Disodium 4-amino-3-[[4'-[(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo] -5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate (C.I. Direct Black 38) (CAS No.: 1937-37-7)	0.05	n.d.
149.	亞乙基硫脲 / Imidazolidine-2-thione; 2-imidazoline-2-thiol (CAS No.: 96-45-7)	0.05	n.d.
150.	醋酸鉛 / Lead di(acetate)*** (CAS No.: 301-04-2)	-	n.d.
151.	磷酸三(二甲苯)酯 / Trixylyl phosphate (CAS No.: 25155-23-1)	0.05	n.d.
152.	鄰苯二甲酸二己酯(支鏈和直鏈) / 1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear (CAS No.: 68515-50-4)	0.05	n.d.
153.	氯化鎘 / Cadmium chloride*** (CAS No.: 10108-64-2)	-	n.d.
154.	過硼酸鈉 / Sodium perborate; perboric acid, sodium salt***	-	n.d.
155.	過氧偏硼酸鈉 / Sodium peroxometaborate*** (CAS No.: 7632-04-4)	-	n.d.
156.	2-(2'-羥基-3',5'-二-叔-戊基苯基)苯並三唑 (紫外線吸收劑328) / 2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328) (CAS No.: 25973-55-1)	0.05	n.d.
157.	2-[2-羥基-3',5'-二-叔-丁基苯基]-苯並三唑 (紫外線吸收劑320) / 2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320) (CAS No.: 3846-71-7)	0.05	n.d.
158.	二正辛基-雙(2-乙基己基巯基乙酸酯)錫 / 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)*** (CAS No.: 15571-58-1)	-	n.d.
159.	氟化鎘 / Cadmium fluoride*** (CAS No.: 7790-79-6)	-	n.d.
160.	硫酸鎘 / Cadmium sulphate*** (CAS No.: 10124-36-4; 31119-53-6)	-	n.d.
161.	二正辛基-雙(2-乙基己基巯基乙酸酯)錫和單辛基-三(2-乙基己基巯基乙酸酯)錫的反應物 / Reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE)***	-	n.d.
162.	鄰苯二甲酸二(C6-10)烷基酯; 鄰苯二甲酸二己、二辛、二癸酯混合物;鄰苯二甲酸二己酯 ≧ 0.3% / 1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with ≧ 0.3% of dihexyl phthalate (CAS No.: 68515-51-5; 68648-93-1)	0.05	n.d.

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No.	物質名稱 (Substance Name)	RL (%)	濃度 (Concentration) (%)
163.	5-二級丁基-2-(2,4-二甲基環己-3-烯-1-基)-5-甲基-1,3-二氧環己烷[1],5-二級丁基-2-(4,6-二甲基環己-3-烯-1-基)-5-甲基-1,3-二氧環己烷[2],[任何[1]和[2]或者其任意組合的單獨異構物或其任何組合] / 5-sec-butyl-2-(2,4-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [1], 5-sec-butyl-2-(4,6-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [2] [covering any of the individual isomers of [1] and [2] or any combination thereof]	0.05	n.d.
164.	1,3-丙烷磺内酯 / 1,3-propanesultone (CAS No.: 1120-71-4)	0.05	n.d.
165.	2,4-二-叔丁基-6-(5-氯-2H-苯并三唑-2-基)苯酚(紫外線吸收劑327) / 2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327) (CAS No.: 3864-99-1)	0.05	n.d.
166.	2-(3-仲-丁基-5-叔丁基-2-羟苯基)苯并三唑(紫外線吸收劑 UV-350) / 2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-350) (CAS No.: 36437-37-3)	0.05	n.d.
167.	硝基苯 / Nitrobenzene (CAS No.: 98-95-3)	0.05	n.d.
168.	全氟壬酸 / Perfluorononan-1-oic acid (2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,9-heptadecafluorononanoic acid and its sodium and ammonium salts (CAS No.: 375-95-1; 21049-39-8; 4149-60-4)	0.05	n.d.
169.	苯并(a)芘 / Benzo[def]chrysene (Benzo[a]pyrene) (CAS No.: 50-32-8)	0.05	n.d.
170.	雙酚A / 4,4'- isopropylidenediphenol (Bisphenol A) (CAS No.: 80-05-7)	0.05	n.d.
171.	4-庚基苯酚，支鍊及直鍊 (4-HPbl)，包括含有7個碳烷基鍵的所有獨立的同分異構體和所有含有線性或分支7個碳烷基鍵的UVCB物質 / 4-Heptylphenol, branched and linear (4-HPbl) [substances with a linear and/or branched alkyl chain with a carbon number of 7 covalently bound predominantly in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof]	0.05	n.d.
172.	十九氟癸酸及其鈉和銨鹽 / Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts (CAS No.: 3108-42-7, 335-76-2, 3830-45-3)	0.05	n.d.
173.	對(1,1-二甲基丙基)苯酚 / p-(1,1- dimethylpropyl) phenol (PTAP) (CAS No.: 80-46-6)	0.05	n.d.
174.	全氟己基磺酸及其鹽類 / Perfluorohexane-1-sulphonic acid and its salts (PFHxS) (CAS No.: 355-46-4)	0.05	n.d.
175.	德克隆(涵蓋各個反式及順式同分易構物或者相關組合) / 1,6,7,8,9,14,15,16,17, 17,18,18-Dodecachloropentacyclo [12.2.1.16,9.02,13.05,10]octadeca-7,15-diene ("Dechlorane Plus" TM) [covering any of its individual anti- and syn-isomers or any combination thereof]	0.05	n.d.
176.	苯並[a]蒽 / Benz[a]anthracene (CAS No.: 56-55-3)	0.05	n.d.
177.	硝酸鎘 / Cadmium nitrate*** (CAS No.: 10325-94-7)	-	n.d.

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No.	物質名稱 (Substance Name)	RL (%)	濃度 (Concentration) (%)
178.	碳酸鎘 / Cadmium carbonate*** (CAS No.: 513-78-0)	-	n.d.
179.	氫氧化鎘 / Cadmium hydroxide*** (CAS No.: 21041-95-2)	-	n.d.
180.	苯並[a]菲 / Chrysene (CAS No.: 218-01-9)	0.05	n.d.
181.	1,3,4-噻唑烷-2,5-二硫酮，甲醛及4-庚基苯酚支鏈及直鏈反應物, (RP-HP) [含≥0.1% w/w 支鏈及直鏈4-庚基苯酚] / Reaction products of 1,3,4-thiadiazolidine-2,5-dithione, formaldehyde and 4-heptylphenol, branched and linear (RP-HP) [with ≥0.1% w/w 4-heptylphenol, branched and linear] (※7)	-	n.d.
182.	鄰苯二甲酸二環己酯 / Dicyclohexyl phthalate (DCHP) (CAS No.: 84-61-7)	0.05	n.d.
183.	1,2,4-苯三甲酸酐 / Benzene-1,2,4- tricarboxylic acid 1,2- anhydride (trimellitic anhydride) (CAS No.: 552-30-7)	0.05	n.d.
184.	苯並(G,H,I)苝 / Benzo[ghi]perylene (CAS No.: 191-24-2)	0.05	n.d.
185.	八甲基環四矽氧烷 / Octamethylcyclotetrasiloxane (D4) (CAS No.: 556-67-2)	0.05	n.d.
186.	十甲基環五矽氧烷 / Decamethylcyclopentasiloxane (D5) (CAS No.: 541-02-6)	0.05	n.d.
187.	十二甲基環六矽氧烷 / Dodecamethylcyclohexasiloxane (D6) (CAS No.: 540-97-6)	0.05	n.d.
188.	氧化硼鈉 / Disodium octaborate*** (CAS No.: 12008-41-2)	-	n.d.
189.	乙二胺 / Ethylenediamine (CAS No.: 107-15-3)	0.05	n.d.
190.	鉛 / Lead (Pb) (CAS No.: 7439-92-1) (●)	0.005	n.d.
191.	氫化三聯苯 / Terphenyl hydrogenated (CAS No.: 61788-32-7)	0.05	n.d.
192.	2,2-雙(4-羥基苯基)-4-甲基戊烷 / 2,2-bis(4'-hydroxyphenyl)-4-methylpentane (CAS No.: 6807-17-6)	0.05	n.d.
193.	苯駢(k)螢蒽 / Benzo[k]fluoranthene (CAS No.: 207-08-9)	0.05	n.d.
194.	苯駢苊 / Fluoranthene (CAS No.: 206-44-0)	0.05	n.d.
195.	菲 / Phenanthrene (CAS No.: 85-01-8)	0.05	n.d.
196.	芘 / Pyrene (CAS No.: 129-00-0)	0.05	n.d.
197.	1,7,7-三甲基-3-(苯亞甲基)雙環[2,2,1]庚-2-酮 / 1,7,7-trimethyl-3-(phenylmethylene) bicyclo[2.2.1]heptan-2-one (3-benzylidene camphor) (CAS No.: 15087-24-8)	0.05	n.d.

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Remark：

1. 高關注物質(SVHC)候選清單 / Candidate List of SVHC (2019/01/15)
   http://echa.europa.eu/web/guest/candidate-list-table
2. 根據Regulation (EC) No 1907/2006 中第7條款第2項之規定，如果物質合乎第57條款之標準以及可依據第59(1)條之規定鑑別，且同時符合下列兩項狀況，任何成品之製造人和進口人應向歐洲化學總署(ECHA)通報：
   (a) 成品中所含物質每年超過1公噸。
   (b) 依重量百分比計算，物質濃度超過0.1% 。
   In accordance with Regulation (EC) No 1907/2006, any producer or importer of articles shall notify ECHA, in accordance with paragraph 2 of Article 7, if a substance meets the criteria in Article 57 and is identified in accordance with Article 59(1) of the Regulation,
   if (a) the substance is present in those articles in quantities totaling over one tonne per producer or importer per year; and (b) the substance is present in those articles above a concentration of 0.1% weight by weight (w/w).
3. Regulation (EC) No 1907/2006中第 33 條要求成品供應商，其成品所含物質符合第57條款的標準並依照第59(1)條款確定其濃度大於0.1wt%，應提供成品接受者充份可取得資訊，以確保成品的安全使用(至少包括物質的名稱)。
   Article 33 of Regulation (EC) No 1907/2006 requires supplier of an article containing a substance meeting the criteria in Article 57 and identified in accordance with Article 59(1) in a concentration above 0.1% weight by weight (w/w) shall provide the recipient of the article with sufficient information, available to the supplier, to allow safe use of the article including, as a minimum, the name of that substance.
4. 如果樣品中高關注物質的濃度超過0.1% (w/w)和/或歐盟(EC)No.1272/2008 CLP法規及其修訂中設定的特殊濃度限值，建議客戶根據歐盟REACH法規No.1907/2006對有關高關注物質準備安全資料表(SDS)以符合供應鏈通信的義務，如：
   (I) 根據(EC)No.1272/2008 CLP法規被列為有害物質。
   (II) 根據(EC)No.1272/2008 CLP法規被列為有害混合物，而當中物質的濃度大於或等於(EC)No.1272/2008 CLP法規列出的濃度限值;或
   (III) 根據(EC)No.1272/2008 CLP法規並未列為有害混合物，但包含：
   (a) 對人類健康或環境有害的物質，而在固體或液體混合物(即非氣體混合物)中其濃度≥1%(w/w)或在氣體混合物中占體積≥0.2%，或
   (b) PBT或vPvB物質，在固體或液體混合物(即非氣體混合物)中個別濃度≥0.1%(w/w)，或
   (c) 授權審議的高關注物質候選清單上的物質(除上述以外的原因)在個別非氣體混合物中的濃度≥0.1%(w/w)，或
   (d) 設有歐洲範圍內工作場所接觸限值的物質。

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If a SVHC is found over 0.1% (w/w) and/or the specific concentration limit which is set in Regulation (EC) No 1272/2008 and its amendments, client is suggested to prepare a Safety Data Sheet (SDS) against the SVHC to comply with the supply chain communication obligation under Regulation (EC) No 1907/2006, in which:
(I) a substance that is classified as hazardous under the CLP Regulation (EC) No 1272/2008.
(II) mixture that is classified as hazardous under the CLP Regulation (EC) No 1272/2008, when it contains a substance with concentration equal to, or greater than the classification limit as set in Regulation (EC) No. 1272/2008; or
(III) a mixture is not classified as hazardous under the CLP Regulation (EC) No 1272/2008, but contains either:
(a) a substance posing human health or environmental hazards in an individual concentration of ≥ 1 % by weight for mixtures that are solid or liquids (i.e., non-gaseous mixtures) or ≥ 0.2 % by volume for gaseous mixtures; or
(b) a substance that is PBT, or vPvB in an individual concentration of ≥ 0.1 % by weight for mixtures that are solid or liquids (i.e., non-gaseous mixtures); or
(c) a substance on the SVHC candidate list (for reasons other than those listed above), in an individual concentration of ≥ 0.1 % by weight for non-gaseous mixtures; or
(d) a substance for which there are Europe-wide workplace exposure limits

5. 倘若SVHC超過限值，建議客戶確認含有該SVHC的零件，並要求實驗室進一步的定量分析而取得SVHC的確切濃度。
If a SVHC is found over the reporting limit, client is suggested to identify the component which contains the SVHC and the exact concentration of the SVHC by requesting further quantitative analysis from the laboratory.

備註(Note)：

1. mg/kg = ppm；0.1wt% = 1000ppm
2. RL = Reporting Limit / 報告極限值
3. n.d.= not detected = below Reporting Limit / 未檢出
4. "-" = Not Regulated / 無規格值
5. (*): 重鉻酸鈉二水合物(CAS No.: 7789-12-0)含量 = 重鉻酸鈉含量 × 1.1374
   (conc. of Sodium dichromate dihydrate = conc. of sodium dichromate × 1.1374)
6. (**): 上述混合物的濃度是經由所獲得的成分比例介於被選擇標靶物及混合物所推估出來. / The concentrations of above-mentioned mixtures are evaluated per the gained composition rate between the selected marks and the mixtures.
7. F 參數換算表/F Parameter Conversion Table：http://twap.sgs.com/sgsrsts/chn/download-REACH_tw.asp
8. 分類/Classification：Please refer to http://twap.sgs.com/sgsrsts/chn/download-REACH_tw.asp
9. (＊1): 鉻酸與重鉻酸的寡聚體: 因為其寡聚體是由未知數的鉻酸或與重鉻酸所組成，而導致沒有固定分子量，因此以單體鉻酸或重鉻酸較為重要並應被考慮。/ Oligomers of chromic acid and dichromic acid : since the oligomers are made of the unknown amount of chromic acid or dichromic acid that results in no fixed molecular weight, therefore the monomer of chromic acid or dichromic acid is relevant and considered.
10. (＊2): 水合硼酸鈉: 依照歐洲化學總署解釋以無水四硼酸二鈉數據作為代表(歐洲化學總署回信編號 Ref no.: INC 000000032519) / Tetraboron disodium heptaoxide, hydrate: Only anhydrous form of disodium tetraborate is relevant and considered according to ECHA explanation (Ref no.: INC 000000032519).

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11. ***: 該物質是由單辛基錫、二辛基錫、三丁基錫、二丁基錫、全氟辛酸或各別元素 (例如: 砷、鉛、六價鉻、硼、鈷、鋇、鎘)之測試結果計算得知. / The substance was calculated by the test results of MonooctylTin, Dioctyl Tin, Tributyl Tin, Dibutyl Tin, PFOA or element (Ex. Arsenic, Lead, Cr(VI), Boron, Cobalt, Barium, Cadmium respectively).

測試結果如下(The test result is given as):

物質名稱 (Substance Name)	RL (%)	濃度 (Concentration) (%)
三丁基錫 / Tributyl Tin (TBT)	0.05	n.d.
砷 / Arsenic (As) (※2)	0.005	n.d.
六價鉻 / Hexavalent Chromium Cr(VI)	0.005	n.d.
硼 / Boron (B) (※2)	0.005	n.d.
鈷 / Cobalt (Co)	0.005	n.d.
二丁基錫 / Dibutyl Tin (DBT)	0.05	n.d.
鋇 / Barium (Ba)	0.005	0.0111
二辛基錫 / Dioctyl Tin (DOT)	0.0231	n.d.
單辛基錫 / MonooctylTin (MOT)	0.0140	n.d.

12. (※1): 此砷鉛化合物之濃度是取砷及鉛兩者各別換算出砷鉛化合物濃度，並取其最小值做為最後出報告之依據.
(Regarding the compound containing arsenic and lead, lead and arsenic are tested and respectively used for the calculation of the independent concentration of the compound containing arsenic and lead. The minimum value of the two independently calculated concentrations is used as the final concentration for the report.)

13. (※2): 被萃取出的溶出硼/砷是以感應耦合電漿原子發射光譜儀檢測得之. / The extracted soluble Boron / Arsenic are detected by ICP-AES.

14. (※3): 由於TGIC本身含有β-TGIC，依照ECHA 技術文件 β-TGIC與 TGIC 約為 1:10 比例，因此β-TGIC將以1/10 的TGIC計算濃度。/ TGIC is a mixture and also contains β-TGIC. According to the ECHA's technical dossier the ratio of β-TGIC to TGIC is around 1 to 10. Therefore β-TGIC is issued based on the above-mentioned ratio.

15. (※4): 只有在矽與鉛定性結果為陽性時，再以鋇之濃度換算之。/ Only if both qualitative results of lead and silicon are positive, the test result of the compound will be calculated based on the concentration of barium.

16. (※5): 此化合物之濃度是取六價鉻及鉛兩者各別換算出化合物濃度，並取其最小值做為最後出報告之依據.
(Regarding the compound containing Cr(VI) and lead, lead and Cr(VI) are tested and respectively used for the calculation of the independent concentration of the compound containing Cr(VI) and lead. The minimum value of the two independently calculated concentrations is used as the final concentration for the report.)

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17. (※7): RP-HP無法直接測得且無法自特定元素計算含量，RP-HP之所以被定義於SVHC是因為4-HPbl，因此分析4-HPbl取代RP-HP. / RP-HP can't be identified directly and test result can't be calculated based on specific element(s) or compound. RP-HP is identified as SVHC because of 4-HPbl, therefore 4-HPbl is analysed instead of RP-HP.
18. (●): 因為鉛有一很廣泛應用，不太可能判定是否檢驗出的鉛是來自鉛離子，鉛元素或鉛化合物，因此用檢驗出的總鉛來代表鉛。 / Since lead has a wide application, it is unlikely to determine if the detected lead comes from the lead ion, lead element or/ and lead compounds. Therefore the detected total lead is used on behalf of lead.

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SVHC 分析流程圖 / Analytical flow chart of SVHC

- 測試人員：涂雅苓, 陳恩臻 / Technician: Yaling Tu, Rita Chen
- 測試負責人：張啟興 / Supervisor: Troy Chang

取樣 / Sampling

↓

樣品以酸消化，溶劑萃取預處理 /
Sample pretreated by acid digestion, solvent extraction

↓

由感應耦合電漿原子發射光譜儀、紫外光可見光譜儀、氣相層析/質譜儀、液相層析/質譜儀、氣相層析儀/火焰光度偵測器、液相層析/質譜儀/二極體陣列偵測器、超高效能液相層析串聯質譜儀進行分析。/ SGS In-House method-RSTS-EE-SVHC-007.
Analyzed by ICP-AES, UV-VIS, GC/MS, LC/MS, GC/FPD, LC/MS/DAD, UPLC-MSMS.

↓

數據 / Data

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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.)

CC/2018/30158

** 報告結尾(End of Report) **

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Signature Not Verified
For Question Please
Contact with SGS
www.sgs.com.tw

測試報告
Test Report

號碼(No.)：CE/2019/32098　日期(Date)：2019/03/15

嘉峰金屬股份有限公司
LI CHUN METALS CO., LTD.
新北市樹林區新興街37巷22號
NO. 22, LANE 37, SHIN HSING ST., SHU LIN DISTRICT, NEW TAIPEI CITY

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/on behalf of the applicant as)：

送樣廠商(Sample Submitted By)　：　嘉峰金屬股份有限公司 (LI CHUN METALS CO., LTD.)
樣品名稱(Sample Description)　：　TIN CLAD COPPER (鍍錫銅)
收件日期(Sample Receiving Date)　：　2019/03/08
測試期間(Testing Period)　：　2019/03/08 to 2019/03/15

==========

測試需求(Test Requested)　：　依據客戶指定，檢測鎘、鉛、汞、六價鉻、多溴聯苯、多溴聯苯醚, DBP, BBP, DEHP, DIBP. (As specified by client, to test Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).)

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

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

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Test Report

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測試結果(Test Results)

測試部位(PART NAME)No.1　:　銀色金屬線 (含鍍層) (SILVER COLORED METAL WIRE (INCLUDING THE PLATING LAYER))

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No.1
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321-5 (2013), 以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n.d.
鉛 / Lead (Pb)	mg/kg	參考IEC 62321-5 (2013), 以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n.d.
汞 / Mercury (Hg)	mg/kg	參考IEC 62321-4 (2013), 以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-4 (2013) and performed by ICP-AES.	2	n.d.
六價鉻 / Hexavalent Chromium Cr(VI)(#2)	$\mu g/cm^2$	參考IEC 62321-7-1 (2015), 以UV-VIS檢測. / With reference to IEC 62321-7-1 (2015) and performed by UV-VIS.	0.10	n.d.
多溴聯苯總和 / Sum of PBBs	mg/kg	參考IEC 62321-6 (2015), 以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-6 (2015) and performed by GC/MS.	-	n.d.
一溴聯苯 / Monobromobiphenyl	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.

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Test Report

號碼(No.) : CE/2019/32098　日期(Date) : 2019/03/15

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NO. 22, LANE 37, SHIN HSING ST., SHU LIN DISTRICT, NEW TAIPEI CITY

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No. 1
多溴聯苯醚總和 / Sum of PBDEs	mg/kg	參考IEC 62321-6 (2015), 以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-6 (2015) and performed by GC/MS.	-	n.d.
一溴聯苯醚 / Monobromodiphenyl ether	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.
鄰苯二甲酸丁苯甲酯 / BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg	參考IEC 62321-8 (2017), 以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg	參考IEC 62321-8 (2017), 以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
鄰苯二甲酸二 (2-乙基己基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg	參考IEC 62321-8 (2017), 以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
鄰苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg	參考IEC 62321-8 (2017), 以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.

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嘉峰金屬股份有限公司
LI CHUN METALS CO., LTD.
新北市樹林區新興街37巷22號
NO. 22, LANE 37, SHIN HSING ST., SHU LIN DISTRICT, NEW TAIPEI CITY

備註(Note)：

1. mg/kg = ppm；0.1wt% = 1000ppm
2. n.d. = Not Detected (未檢出)
3. MDL = Method Detection Limit (方法偵測極限值)
4. "-" = Not Regulated (無規格值)
5. (#2) =
   a. 當六價鉻結果大於0.13 μg/cm²，表示樣品表層含有六價鉻. / The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 μg/cm². The sample coating is considered to contain Cr(VI).
   b. 當六價鉻結果為n.d. (濃度小於0.10 μg/cm²)，表示表層不含六價鉻. / The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 μg/cm²). The coating is considered a non-Cr(VI) based coating
   c. 當六價鉻結果介於 0.10 及 0.13 μg/cm² 時，無法確定塗層是否含有六價鉻. / The result between 0.10 μg/cm² and 0.13 μg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.
6. 樣品的測試是基於申請人要求混合測試，報告中的混合測試結果不代表其中個別單一材質的含量. (The samples was/were analyzed on behalf of the applicant as mixing sample in one testing. The above results was/were only given as the informality value.)

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NO. 22, LANE 37, SHIN HSING ST., SHU LIN DISTRICT, NEW TAIPEI CITY

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）

- 測試人員：陳恩臻 / Technician : Rita Chen
- 測試負責人：張啟興 / Supervisor: Troy Chang

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NO. 22, LANE 37, SHIN HSING ST., SHU LIN DISTRICT, NEW TAIPEI CITY

多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBB/PBDE

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor: Troy Chang

初次測試程序 / First testing process
選擇性篩檢程序 / Optional screen process
確認程序 / Confirmation process

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NO. 22, LANE 37, SHIN HSING ST., SHU LIN DISTRICT, NEW TAIPEI CITY

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

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor : Troy Chang

【測試方法/Test method: IEC 62321-8】

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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.)

CE/2019/32098

** 報告結尾 (End of Report) **

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Signature Not Verified
For Question Please
Contact with SGS
www.sgs.com.tw

測試報告
Test Report

號碼(No.) : CE/2019/51555　　日期(Date) : 2019/05/16　　

廣雄實業有限公司
GUANG SHIUNG ENTERPRISE LTD.
新北市新莊區復興路三段71號
NO. 71, SEC. 3, FU HSING RD., SHIN CHUANG DIST., NEW TAIPEI CITY, 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/on behalf of the applicant as):

送樣廠商(Sample Submitted By)	:	廣雄實業有限公司 (GUANG SHIUNG ENTERPRISE LTD.)
樣品名稱(Sample Description)	:	PVC AWM
樣品型號(Style/Item No.)	:	UL1571, UL1061, UL1095, UL1007, 軟質PVC WIRE
買主/訂單號碼(Buyer/Order No.)	:	廣雄實業有限公司 (GUANG SHIUNG ENTERPRISE LTD.)
其他(Other Info.)	:	棕色塑膠外被及其上黑色印刷, 藍色塑膠外被及其上黑色印刷, 黃色塑膠外被及其上黑色印刷, 灰色塑膠外被及其上黑色印刷, 紫色塑膠外被及其上黑色印刷, 黑色塑膠外被及其上白色印刷, 橘色塑膠外被及其上黑色印刷, 紅色塑膠外被及其上黑色印刷, 綠色塑膠外被及其上黑色印刷,白色塑膠外被 (BROWN PLASTIC JACKET WITH BLACK PRINTED, BLUE PLASTIC JACKET WITH BLACK PRINTED, YELLOW PLASTIC JACKET WITH BLACK PRINTED, GRAY PLASTIC JACKET WITH BLACK PRINTED, PURPLE PLASTIC JACKET WITH BLACK PRINTED, BLACK PLASTIC JACKET WITH WHITE PRINTED, ORANGE PLASTIC JACKET WITH BLACK PRINTED, RED PLASTIC JACKET WITH BLACK PRINTED, GREEN PLASTIC JACKET WITH BLACK PRINTED, WHITE PLASTIC JACKET)
收件日期(Sample Receiving Date)	:	2019/05/09
測試期間(Testing Period)	:	2019/05/09 to 2019/05/16

==========

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

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

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測試報告
Test Report

廣雄實業有限公司
GUANG SHIUNG ENTERPRISE LTD.
新北市新莊區復興路三段71號
NO. 71, SEC. 3, FU HSING RD., SHIN CHUANG DIST., NEW TAIPEI CITY, TAIWAN

測試結果(Test Results)

測試部位(PART NAME)No.1　:　混測所有顏色塑膠外被（含印刷）(MIXED ALL COLOR PLASTIC JACKET (INCLUDING THE PRINTED))

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result) No.1
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321-5 (2013)，以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n.d.
鉛 / Lead (Pb)	mg/kg	參考IEC 62321-5 (2013)，以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n.d.
汞 / Mercury (Hg)	mg/kg	參考IEC 62321-4:2013+ AMD1:2017，以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-4:2013+ AMD1:2017 and performed by ICP-AES.	2	n.d.
六價鉻 / Hexavalent Chromium Cr(VI)	mg/kg	參考IEC 62321-7-2 (2017)，以UV-VIS檢測. / With reference to IEC 62321-7-2 (2017) and performed by UV-VIS.	8	n.d.
多溴聯苯總和 / Sum of PBBs	mg/kg	參考IEC 62321-6 (2015)，以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-6 (2015) and performed by GC/MS.	-	n.d.
一溴聯苯 / Monobromobiphenyl	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.

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測試報告
Test Report

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GUANG SHIUNG ENTERPRISE LTD.
新北市新莊區復興路三段71號
NO. 71, SEC. 3, FU HSING RD., SHIN CHUANG DIST., NEW TAIPEI CITY, TAIWAN

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result) No.1
多溴聯苯醚總和 / Sum of PBDEs	mg/kg	參考IEC 62321-6 (2015)，以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-6 (2015) and performed by GC/MS.	-	n.d.
一溴聯苯醚 / Monobromodiphenyl ether	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.
鄰苯二甲酸二 (2-乙基己基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg	參考IEC 62321-8 (2017)，以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	173
鄰苯二甲酸丁苯甲酯 / BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg		50	n.d.
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg		50	n.d.
鄰苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg		50	n.d.
鄰苯二甲酸二異癸酯 / DIDP (Di-isodecyl phthalate) (CAS No.: 26761-40-0; 68515-49-1)	mg/kg		50	n.d.
鄰苯二甲酸二異壬酯 / DINP (Di-isononyl phthalate) (CAS No.: 28553-12-0; 68515-48-0)	mg/kg		50	n.d.
鄰苯二甲酸二正辛酯 / DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	mg/kg		50	n.d.

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1. mg/kg = ppm；0.1wt% = 1000ppm
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3. n.d. = Not Detected（未檢出）
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5. 樣品的測試是基於申請人要求混合測試，報告中的混合測試結果不代表其中個別單一材質的含量.（The samples was/were analyzed on behalf of the applicant as mixing sample in one testing. The above results was/were only given as the informality value.）

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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）

- 測試人員：陳恩臻 / Technician : Rita Chen
- 測試負責人：張啟興 / Supervisor: Troy Chang

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NO. 71, SEC. 3, FU HSING RD., SHIN CHUANG DIST., NEW TAIPEI CITY, TAIWAN

多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBB/PBDE

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor: Troy Chang

初次測試程序 / First testing process
選擇性篩檢程序 / Optional screen process
確認程序 / Confirmation process

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廣雄實業有限公司
GUANG SHIUNG ENTERPRISE LTD.
新北市新莊區復興路三段71號
NO. 71, SEC. 3, FU HSING RD., SHIN CHUANG DIST., NEW TAIPEI CITY, TAIWAN

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

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor : Troy Chang

【測試方法/Test method: IEC 62321-8】

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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.)

CE/2019/51555

** 報告結尾 (End of Report) **

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See General Information for Appliance Wiring Material - Component

GUANG SHIUNG ENTERPRISE LTD
71 FU HSING RD, SEC 3
HSIN CHUANG, TAIPEI HSIEN 242 TAIWAN

E203736

Table of Recognized Styles							
Single-conductor, thermoplastic insulation.							
1007	1061	1095	1195	1571			

Marking: Company name, voltage rating, temperature rating, conductor size, conductor material if other than copper, and use.
Last Updated on 2015-12-10

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7.

熱收縮膜
SGS報告書

长园长通新材料股份有限公司

Shenzhen CYG Changtong New Maeterial Co., Ltd.

承 认 书

CERTIFICATION

客户名称： 东莞市瑞腾电子有限公司

Dongguan city ruiteng electronic co., LTD

产品名称： 环保型 PET 热收缩套管

Products Name: PET Heat Shrinkable Plastic Tube

产品规格： Φ9、Φ11.7、Φ14.5、Φ19.1、Φ23.5 料号：

Products Size: Φ9、Φ11.7、Φ14.5、Φ19.1、Φ23.5 Material no:

东莞市瑞腾电子有限公司 Dongguan city ruiteng electronic co., LTD			长园长通新材料股份有限公司 CYG Changtong New Material Co., Ltd.			
批准 Approved by	研发 Received by	品质部 QC	批 准 Approved by	技术 R&D	品质部 QC	作成 made
			尚增亮	姚金富	谭春娥	朱美琴
日 期 Date	日 期 Date	日 期 Date	日 期 Date	日 期 Date	日 期 Date	日 期 Date
			2017-03-10	2017-03-10	2017-03-10	2017-03-10

地址：深圳市光明新区公明办事处楼村社区第一工业区浩轩工业园

Add: 3rd Floor, Building C and Building A, First Industry Haoxuan Industrial Park, Lou Country, Gongming Area, Guangming new area, Shenzhen, P, R, China

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Tel: (0755)23198258 Fax: (0755)26953402

电子邮箱：changtong@changyuan.com

网　　址：http://www.cyg.com

版次	修订日期	修订符号	页次	修订内容	修订原因	制定	确认

目录：

- 公司简介
- 主要设备及检测仪器
- 材料规格表
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- PET 热收缩套管检验方法
- 产品防护作业指导
- MSDS 数据表
- 原材料供应商
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- 成品检验作业流程图
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CYG长园长园长通新材料股份有限公司

Shenzhen CYG Changtong New Maeterial Co., Ltd.

一. 公 司 简 介

长园长通新材料股份有限公司(简称长通公司)是中国最大的热缩材料生产企业长园新材料股份有限公司(股票代码：600525)属下的高新技术企业。

- 1986 年由中科院创立深圳市长园新材料股份有限公司
- 1991 年分别被认定为广东省和深圳市的首批高新技术企业
- 1996 年李嘉诚旗下的长和投资有限公司入主长园，成为长园新材第一大股东，注册资本增至 4706 万元
- 1999 年被国家科技部和中国科学院认定为高新技术企业
- 2000 年长园新材改制为股份公司，注册资本为 7454 万元
- 2002 年发行 2500 万 A 股并在上交所上市，注册资本增至 9954 万元
- 公司占地 8 万平方米
- 研发、厂房及办公大楼共计 7 万平方米

随着市场环保化的需要，在公司全体员工的共同努力下，开发出绿色环保型 PET 热收缩套管，主要应用于铝电解电容器、电池、电感等电子元件及轻工产品之封装保护。

公司已推行 ISO9001 质量保证体系，取得了 ISO9001：2008 版国际质量体系认证，同时公司注重社会效益，积极履行社会责任，已全面实施 ISO14001 环境管理体系，取得了 ISO14001 国际认证证书。

二．主要设备及检测仪器

2.1.主要生产设备清单

设备名称	型号规格	台数	主要功能	购进金额	购进日期
挤出主机	Φ30-Φ45	10	原材料混合挤出	36 万元	2003.12
定型辅机	/	10	产品定型	48 万元	2003.12
印字机	单面机	8	单面字体印刷	1.8 万	2003.12
	双面机	2	双面字体印刷	4 万	2010.04
干燥料斗	/	18	材料干燥	2．8 万元	2003.12
除湿机	/	18	材料除湿干燥	28．8 万元	2003.12
双螺杆混合机	Φ30、Φ50	2	原材料混合	15 万元	2004.04
电子加速器	1MEV,2.5MEV	5	管材/片材辐照交联	1200 万元	1998.02
管材扩张机	Ø3-ø60	10	管材扩张	20 万元	2001.03
拉伸机	/	1	普通型片材扩幅	10 万元	1999.03
挤出复合机组	SJ1400B	1	加强型片材复合，普通型片材成型	200 万元	2000.03

2.2 主要检测实验仪器

仪器名称	型号规格	台数	检验项目	单台价格
烘箱	/	4 台	高温收缩、二次收缩	2 万元
硅瓷加热片	/	1	套管收缩	0.2 万元
拉力测试器	XL-100	1	断裂伸长率	8 万元
恒温恒湿箱	501	2	耐温测试	5 万元
熔点仪	XR400	1	材料软化点	2 万元
放大镜	120 倍	1	产品表面观察	0.2 万元
耐压测试仪	/	1	产品耐电压测试	9 万元
电火花检测仪	JG-4	2 台	查热缩套管质量缺陷	2 万元
高低温测试仪	/	1	高低温循环测试	45 万元
RoHS 检测仪	EDX3000B	1	欧盟 RoHS 检测	20 万元
卤素检测仪	IC90	1	卤素检测	40 万元

三、材料规格表：

3.1 胶管特性规格表：

（图一）

（图二）

（图一、二） 套管外形尺寸图：

a.套管规格特性表 (表 2)

规格	折径（mm）	厚度（mm）	横向收缩（%）	纵向收缩（%）	备注
9Φ	19±0.2	0.08±0.02	48±4	8±3	
11.7Φ	19±0.2	0.08±0.02	48±4	8±3	
14.5Φ	19±0.2	0.08±0.02	48±4	8±3	
19.1Φ	31.8±0.2	0.11±0.02	48±4	8±3	
23.5Φ	38.5±0.2	0.11±0.02	48±4	8±3	

备 注：

1、可根据客户之需要生产 3Φ-200Φ任何规格套管

2、包装长度:4Φ-22Φ为 200 米/盘，3Φ及 25Φ（含 25Φ）以上为 100 米/盘。

b.套管特性表

序号	项目		单位	PET 套管性能
1	主要成份		—	聚对苯二甲酸乙二醇酯
2	外观		—	表面光滑、厚度均匀、色泽深浅一致、无明显斑点、无波浪形和机械损伤
3	密度		g/cm^3	1.2~1.4
4	折径/厚度		mm	符合表 2 要求
5	颜色		—	符合色样要求
6	水煮热缩性		%	符合表 2 要求
7	阻燃性		—	—
8	耐高温性能	原材料检测	%	符合表 2 要求
9		成品检测	—	180℃放置 15 分钟，无开裂和二次收缩
10	硅油试验		—	160℃±2℃硅油放置 3 分钟，外观无破裂，上下胶管覆盖量符合要求
11	直线度		mm/m	≤5
12	表面电阻率		MΩ	≥500
13	印字牢固度		—	含酒精的脱脂棉擦拭无褪色、掉字现象
14	抗拉强度		kg/cm^2	≥500
15	寿命试验		h	125℃高温直流试验 3000h 套管无开裂
16	使用温度		℃	-55~130

注 1：如果电容器裸品未完全烘干，PET 套管组套后经高温烘烤时易出现起鼓异常，且无法脱胶，故验证过程中务必将电容器裸品完全烘干。

注 2：PET 套管为 125℃环保型胶管。

四、原材料成份表及内部构造性能表

4.1 材料成份表:

我司 PET 环保型热缩套管主要材料为聚对苯二甲酸乙二醇酯树脂，具体组成如下表:

原料名称			使用目的	含量	供应商
中文	ENGLISH	分子式			
聚对苯二甲酸乙二醇酯	PET	$(CH_2-CH_2-COO_{ph}COO)_n$	主剂	95%	韩国 SK
四季戊四醇酯	Anti-oxide	$C_{73}H_{108}O_{12}$	抗氧剂	0.5%	商琪
色母	Pigment	色粉+填充剂	着色剂	4.5%	东方/远华

4.2 内部构造性能表:

序号	项目	单位	性能
1	分子式	/	
2	外　观	/	无污染.异物等混入、无针孔、无机械损伤
3	外观(不溶融物)	mm^2	≤0.7
4	弯曲(280MM)	mm	8Φ以下<3.0 10Φ以上<3.5
5	比　重	kg/L	1.3～1.4
6	破断强度	N/m²	5.0×10^7 ～ 10.0×10^7
7	破断伸度	%	200～350
8	引裂强度	N/mm	100～300
9	吸水率	%	<2.0%
10	绝缘破坏强度	KV/mm	>80
11	表面抵抗率	Ω	$>10^9$
12	体积抵抗率	Ω.cm	$>10^{14}$
13	连续使用温度	℃	(-40～+125)℃
14	熔点	℃	240℃

注意:

1.使用 PET 胶管时,载体(电容器裸品等)表面需洁净及干燥、无锐角毛刺.

2.PET 胶管套于载体上后,需经高温老化,使胶皮固化,不易再发生异常,如起鼓、破裂、二次收缩等.

3.PET 胶管不易用溶剂进行脱胶,请使用前多做确认,以免误套不同规格造成损失.

五. PET 热收缩套管检验方法.

5.1 **目　　的**:为防止 PET 套管二次收缩及确保收缩稳定性.

5.2 **检验方法**:产品中取样进行下列测试:

5.2.1 **外观**:以目视检查套管表面是否有刮伤、明显斑点、弯曲、印字是否残缺或模糊不清.

5.2.2 **折径**:用数显游标卡尺测量其折径是否符合《PET 热缩套管规格特性表》。

5.2.3 **厚度**:用数显千分尺测量其单面厚度是否符合《PET 热缩套管规格特性表》。

5.2.4 **横向收缩率**: 取 10cm 长度,将套管张开成圆柱状，置于 98±2℃沸水中 30 秒后取出,将其压偏对折,量取宽度,进行计算:

L1-收缩前的宽度　　L2-收缩后的宽度

收缩计算方式: $\frac{L1-L2}{L1}$ ×100%=横向收缩率

5.2.5 **纵向收缩率**: 取 10cm 长度,将套管张开成圆柱状，置于 98±2℃沸水中 30 秒后取出，用钢尺量取长度,进行计算:

L1-收缩前的长度　　L2-收缩后的长度

收缩计算方式: $\frac{L1-L2}{L1}$ ×100%=纵向收缩率

5.3 **耐高温胶管**（耐二次收缩）之评价方法:

(a) 取 10cm 长度套管。

（b）将套管放入可恒温控制且热风循环之热烘箱中，于（180±2）℃恒温烤箱中,放置 15 分钟后取出,量取长度,算其高温收缩率. 计算方法同第 5.2.4 项操作相同。

要求标准见《PET 热缩套管规格特性表》。

5.4 **硅油试验**:

（a）将 PET 套管套上清洗烘干后的电容器裸品，并用热风使其收缩完整。

（b）经 105 ℃X1 小时充电老化后（或烘箱烘烤）。

（c）将上述电容器放入（160±2）℃的恒温硅油中，悬挂 3 分钟。

（d）取出冷却后观察。

要求标准：外观无破裂，上下套管覆盖符合要求。

七、MSDS 数据表

1. 物质名称和制造商资料

Material Identification and Manufacturer Information

物资名称：PET 热缩套管 **Material Identification**: PET Heat Shrinkable Sleeve
物资编号：无 **Material Code Number**: none
制造商名称、地点及电话：长园长通新材料股份有限公司 地址：深圳市光明新区光明大街长园新材光明基地　联系电话：0755-23198258 **Manufacturer Information**: ***CYG Changtong New Materials Co., Ltd.*** **Address**: CYG Guangming Production Base, Guangming New District, Shenzhen City **Contact Phone Number**: 0755-23198258
紧急联络电话/传真：0755-23198258 /0755-26953402 **Emergency Contact Phone/Fax**: 0755-23198258/0755-26953402

2. 物料组成成分

Composition/Information of Ingredients

纯物质主要成分

Major Components

化学品中文名：聚对苯二甲酸乙二醇酯 Chinese Name of Chemical:
化学品英文名：Polyethylene terephthalate，简称 PET **English Name of Chemical**: Polyethylene terephthalate, PET for short
化学文摘社登记号（CAS　NO）：25038-59-9 **CAS No.**: 25038-59-9
Percentage (%)：聚对苯二甲酸乙二醇酯占比例 85%，助剂占比例 10%，颜料占比例 4%，润滑剂占比例 1%。 **Percentage (%)**: Polyethylene terephthalate 85%; Auxiliaries 10%; Pigments 14%; Lubricants 1%
危害物质成分：无 **Hazardous Components**: none

3. 危害性描述

Hazards Identification

最重要危害物质效应 **Most Important Hazardous Substance Effects**	健康危害效应：无 **Potential Health Effects**: none
	环境影响：不易被生物降解，但加入分解物，能促进其降解。 **Potential Environmental Effects**: Being difficult of biodegradation, but with decomposers added, its degradation could be accelerated.
	物理和化学性危害：无 **Potential Physical and Chemical Hazards**: none
	特殊危害：无 **Special Hazards**: none
主要症状：无 **Cardinal Symptoms**: none	
物品危害分类：可燃物 **Category of Hazardous Substances**: combustible materials	

4. 急救措施

Firs Aid Measures

不同暴露途径的急救方法： **First-aid for Different Exposure Approaches**: 1、 吸入：固体物，不可能吸入。 **Inhalation**: solids, which inhalation is impossible. 2、 皮肤接触：对皮肤无影响，如有接触用水清洗。 **Skin Contact**: No effect on skin. Cleansing by water in case of skin contact. 3、 眼睛接触：用水清洗；有伤及眼睛，应及时求医。 **Eye Contact**: Immediately flush by plenty of water and call a physician if eye is injured. 4、 食入：催吐，送医诊治。 **Ingestion**: Promote emesis and send to hospital for diagnosis.
最重要症状及危害效应：无 **Most Important Symptoms and Hazardous Effect**: none
对急救人员的防护：不需要 **Protection of Firs-aid Personnel**: unnecessary
对医生的提示：告知医生有关患者之症状。 **Presentation to Physicians**: Describe the symptoms of the patient in detail.

5. 消防措施：

Fire Fighting Measures

适用灭火剂：化学干粉、二氧化碳、泡沫、水、砂等灭火物质。 **Applicable Extinguishing Media**: chemical dry powder, carbon dioxide, foam, water and sand

灭火时可能遇到的特殊危害：人员撤离；物质燃烧时，产生大量的热量，不完全燃烧可能产生一氧化碳及浓烟等，吸入会发生危险，因此灭火时一定要用防毒面具，隔热防护衣、防火手套。

Special Hazards during Fire Fighting:

Evacuate personnel to a safe area. Self-contained breathing apparatus, heat-insulated protective ensembles and gloves are necessary in fire fighting as a great quantity of heat might be occurred during combustion and the incomplete combustion will produce monoxide and smoke, which inhalation is dangerous.

特殊灭火程序：水雾不能有效灭火时，采用泡沫灭火器和干粉灭火器，用水冷却未燃烧物质。

Special Fire Fighting Procedures:

If water spraying is invalid in fire fighting, it should use foam fire extinguishers and dry powder extinguisher. Use water to cool down those unburned goods.

消防人员特殊防护装备：佩戴防毒口罩、防火手套、隔热防护衣。

Special Apparatus for Fire Fighters:

Wear anti-poison respirator, fireproof gloves and heat-insulated protective ensembles.

6. 泄漏应急处理

Emergency treatment

泄露应急措施：胶管为固体物质，不存在泄露问题。

Leak emergency measures: Tube is solid material, there is no leakage problem.

7. 处置和储存

Handling and Storage

处置：

Handling:

1、 在工作场所请不要与火源接触，不要用手直接接触套管。

Don't contact combustion source on workplace and don't use your hand to touch the sleeves directly.

2、 加工场所温度会升高，防止收缩，应安装散热装置。

The processing workplace temperature will rise up so that heat radiator is required to prevent the sleeves from self-shrinkage.

储存：

Storage:

1. 避免阳光直射。

Avoid the sleeves from direct sunshine.

2. 远离火源，以防产品收缩，影响使用性能。

Keep the sleeves far away from combustion source and prevent the sleeves from self-shrinkage to influence the performance.

3. 储存在 30℃以下，且通风良好。

Store the sleeves at a place below 30℃ with good ventilation.

4. 忌重压且轻拿轻放。 Avoid any heavy load on the sleeves and always handle them carefully.

8. 接触控制和个人防护措施

Contact Control and personnel Protective Measures

工程控制：提供良好的工作环境，防止温度升高，产品收缩。 **Engineering Control:** Provide a good working condition to prevent the products from shrinkage caused by rising temperature.			
控制参数 **Control Parameters**			
八小时 平均允许浓度 **TWA** 8 Hours Time Weighted Average Allowable Concentration	短时间内 平均允许浓度 **STEL** Average Allowable Concentration for Short Time Exposure Limit	最高允许浓度 **CEILING** Maximum Allowable Concentration	生物指标 **BEIS** Biological Exposure Indices
无资料 No information	无资料 No information	无资料 No information	无资料 No information
个人防护设备：无 **Personnel Protective Apparatus: none** 呼吸防护：无 **Respiratory Protection: none** 手部防护：无 **Hand Protection: none** 眼睛防护：无 **Eyes Protection: none** 皮肤及身体防护：无 **Skin and Body Protection: none**			
卫生措施：接触后洗手即可。 **Sanitary Measures:** Just wash your hands only if you contact it.			

9. 理化特性

Physicochemical Properties

物质状态：固体 **State of Substance:** solid	形状：管材 **Shape:** tubing
颜色：不确定 **Color:** indeterminacy	气味：无味 **Odor:** odorless

分解温度：>300℃ **Temperature of Decomposition**: 300℃	熔点：>230℃ **Melting Point**: >230℃
比重：1.2-1.5g/cm^3 **Specific Gravity**: 1.2-1.5g/cm^3	溶解性：不溶于水 **Solubility**: insoluble in water
拉伸强度：＞35MPa **Tensile Strength**: ＞35MPa	断裂伸长率：＞50% **Elongation at Break**: ＞50%

10. 稳定性和反应活性
Stability and Reactivity

稳定性：常温下稳定 **Stability**: stable at normal temperature
特殊状况下可能的危害反应：无 **Potential Harmful Reaction under Special Condition**: none
应避免状况：热、重压。 **Conditions to be Avoided**: heat, heavy load
应避免之物质：碱、油类物质。 **Substances to be Avoided**: alkali, oily substances
危害分解物：无 **Harmful Substances by Decomposition**: none

11. 毒理资料
Toxicological Information

急毒性：**Acute Toxicity:** 皮肤：无 **Skin**: none 眼睛：无 **Eyes**: none
局部效应：无 **Local Effect**: none
致敏感性：无 **Induced Sensibility**: none
慢毒性或长期毒性：无 **Chronic Toxicity or Long Term Toxicity**: none
特殊效应：无 **Special Effect**: none

12. 生态资料
Ecological Information

不易被生物分解，但可用适当方式回收利用；加入适当的分解物，促进分解。 The biological decomposition of this substance is difficult. However, it could be recycled by

proper manner. With proper decomposers added, the decomposition could be accelerated.

13. 废弃处置

Disposal Consideration

废弃处置方法：集中回收再利用。 参考相关法规规定。 **Waste Disposal**: Collected together for recycling. Refer to the related law and regulations.

14. 运输资料

Transportation Information

根据运输规则，不列入危险品。 It is not regulated as a dangerous goods in transportation.
联合国编号：无　　**UN Code No.: none**
国内运输规定： **Regulations for Domestic Transportation** 1.纸箱包装完整,内有保利龙片保护,货运温度保持 30℃以下,防重压、防倒塌、防损坏 1. Complete carton package is required with inside expandable polystyrene sheet protection. It should maintain the shipment temperature below 30℃ and the necessary measures are taken in transportation to prevent the goods from heavy load, collapse and damage. 2. 遵守运输道路交通法规。 Always abide by the road transportation traffic rules.

15. 法规资料

Regulatory Information

不属于危险物质 It does not belong to a dangerous goods.

16. 其他资料

Other Information

参考文献资料 Reference Documentation	暂无 Not available.
制表单位 Data Sheet Maker	名称：长园长通新材料股份有限公司 Name: CYG Changtong New Materials Co., Ltd.
	地址/电话：深圳市光明新区光明大街长园新材光明基地 联系电话：0755-23198258 Address: CYG Guangming Production Base, Guangming New District, Shenzhen City Contact Phone Number: 0755-23198258
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Prepared by:Yao Jinfu　　Reviewed by: Yuenjing　　Approved by: Shang Zengliang

八、主要供应商信息:

供应商名称	国内或业内地位	供应产品名称	年采购量	采购周期
南亚塑胶	台塑公司	PET 原材料	400 吨	15 天
伊仕曼	美国公司	PET 原材料	200 吨	30 天
韩国 SK	韩国公司	PET 原材料	100 吨	30 天
商琪	台塑公司	抗氧剂	2 吨	30 天
东方/远华	大陆公司	着色剂	10 吨	30 天

九. PET 套管质量管理流程图

流程图 材料-流程图	工序 名称	质量管 制重点	管制方法 作业标准	记录表格	异常处理	作业人员	责任人员	测定	检测方法及设备 仪器
	原材料检验	外观物性	检验试验手册	收料单 检测报告	退货	质检员	质检负责人	进货抽样	检测中心
	配料	颜色 重量		配料记录表	报废	作业员	班长	全检	电子称 目视
	混合	材料重量	混合作业指导书	混合记录表	报废	作业员	班长	全检	电子称 目视 变频器 目视 时钟 目视
	干燥	温度 时间	干燥作业指导书	干燥记录表	调节	作业员	班长	全检	温度表 目视 时钟 目视
	挤出成型	温度 时间	挤出作业指导书	挤出生产记录表	调节	作业员	班长	四小时检一次	温控仪表 目视 记米器 目视 秒表 目视
		折径、厚度 横向收缩率 丛向收缩率 高温收缩率 直线度 外观、米数	空白胶管检验标准	空白胶管自检记录表 空白胶管送检入库单	报废	作业员	班长	全检	游标卡尺 目视 千分尺 目视 直尺 目视 胶管表面 目视 计米器码表 目视
	空白胶管成品最终检验	折径、厚度 横向收缩率 丛向收缩率 高温收缩率 直线度、外观	空白胶管检验标准	空白胶管最终检验记录单	报废	质检员	质检负责人	全检	游标卡尺 目视 直尺 目视 千分尺 目视 胶管表面 目视
	胶管印刷	外观 留边量 客户技术要求	客户技术要求	印刷指令 胶管印刷质量检验单	报废	作业员	班长	全检	胶管表面 目视 毫米尺 目视
	印刷成品最终检验	外观 留边量 客户技术要求	客户技术要求	印刷胶管最终质量检验单	报废	质检员	质检负责人	全检	胶管表面 目视 毫米尺 目视
	出厂检验	包装客户技术要求数量	客户规格书	出厂检验报告 出货记录表	核对调节	质检员 仓管员	生产负责人 质量	全检	游标卡尺 目视

							负 责 人		

注： □ 检验 ○ 加工 ◯ 加工检验 ⬠ 加入原材料

十. PET 成品检验作业流程图

长园长通新材料有限公司

PET 成品检验作业流程图

十一、长园长通PET套管质量保证体系流程图

十二、附件

- SGS 报告　　详见附件 1（黑色通用）
- ISO9001-2008 证书　详见附件 2
- ISO14001-2000 证书　详见附件 3
- 企业法人营业执照
- 税务登记证　　详见附件 4

附件:

黑色胶管
英文版ROHS报告.

复件 复件
质量管理体系90(

复件 复件
环境管理体系14(

长通股份公司信
用代码（正本）2

附件 1　　附件 2　　附件 3　　附件 4

CYG CHANGTONG NEW MATERIAL CO., LTD.

5TH FLOOR, G BUILDING, CHANGYUAN BASE, GUANGMING STREET, GUANGMING AREA, SHENZHEN, GUANGDONG,CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : PET thermal shrinkage hose black

SGS Job No. :	CP18-059888 - SZ
Lot No. :	1801102
Date of Sample Received :	06 Nov 2018
Testing Period :	06 Nov 2018 - 14 Nov 2018
Test Requested :	Selected test(s) as requested by client.
Test Method :	Please refer to next page(s).
Test Results :	Please refer to next page(s).
Conclusion :	Based on the performed tests on submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP) , Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) , and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of
SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

Zmguan

Zm guan
Approved Signatory

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	CAN18-229537.003	Black tube

Remarks :

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to IEC 62321-4:2013+A1:2017, IEC 62321-5:2013, IEC 62321-7-2:2017 , IEC 62321-6:2015 and IEC 62321-8:2017, analyzed by ICP-OES , UV-Vis and GC-MS .

Test Item(s)	Limit	Unit	MDL	*003*
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	ND
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (CrVI)	1,000	mg/kg	8	ND
Sum of PBBs	1,000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1,000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND

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Test Item(s)	Limit	Unit	MDL	003
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND
Dibutyl phthalate (DBP)	1,000	mg/kg	50	ND
Butyl benzyl phthalate (BBP)	1,000	mg/kg	50	ND
Bis (2-ethylhexyl) phthalate (DEHP)	1,000	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	1,000	mg/kg	50	ND

Notes :

(1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.IEC 62321 series is equivalent to EN 62321 series
http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101::::FSP_ORG_ID,FSP_LANG_ID:1258637,25

Halogen

Test Method : With reference to EN 14582:2016, analysis was performed by IC.

Test Item(s)	Unit	MDL	003
Fluorine (F)	mg/kg	50	ND
Chlorine (Cl)	mg/kg	50	ND
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND

Elementary Analysis

Test Method : SGS In-house method (GZTC CHEM-TOP-004-01, with reference to US EPA Method 3052:1996), analysis was performed by ICP-OES.

Test Item(s)	Unit	MDL	003
Arsenic (As)	mg/kg	10	ND
Antimony (Sb)	mg/kg	10	107

Red Phosphor

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Test Method : SGS In-house method (GZTC CHEM-TOP-215-01), analysis was performed by PY-GC/MS& ICP-OES.

Test Item(s)	Unit	MDL	*003*
Red phosphorus	mg/kg	500	ND

PVC (Polyvinyl chloride)

Test Method : SGS in house method(GZTC CHEM-TOP-066), analysis was performed by FTIR.

Test Item(s)	CAS NO.	Unit	MDL	*003*
PVC	9002-86-2	-	-	Negative

Notes :

(1) Negative=Undetectable,Positive=Detectable

Bisphenol-A

Test Method : SGS In-house method (GZTC CHEM-TOP-075-02, with reference to US EPA Method 3550C:2007), analysis was performed by HPLC-MS.

Test Item(s)	Unit	MDL	*003*
Bisphenol-A	mg/kg	1.0	ND

Hexabromocyclododecane (HBCDD)

Test Method : With reference to IEC 62321:2008, analysis was performed by GC-MS.

Test Item(s)	Unit	MDL	*003*
Hexabromocyclododecane (HBCDD)	mg/kg	10	ND

Phthalate

Test Method : With reference to EN14372: 2004. Analysis was performed by GC-MS.

Test Item(s)	CAS NO.	Unit	MDL	003
Dibutyl Phthalate (DBP)	84-74-2	%(w/w)	0.003	ND

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Test Item(s)	CAS NO.	Unit	MDL	003
Benzylbutyl Phthalate (BBP)	85-68-7	%(w/w)	0.003	ND
Bis(2-ethylhexyl) Phthalate (DEHP)	117-81-7	%(w/w)	0.003	ND
Diisononyl Phthalate (DINP)	28553-12-0 / 68515-48-0	%(w/w)	0.010	ND
Di-n-octyl Phthalate (DNOP)	117-84-0	%(w/w)	0.003	ND
Diisodecyl Phthalate (DIDP)	26761-40-0 / 68515-49-1	%(w/w)	0.010	ND
Dimethyl Phthalate (DMP)	131-11-3	%(w/w)	0.003	ND
Diethyl Phthalate (DEP)	84-66-2	%(w/w)	0.003	ND
Diisobutyl Phthalate (DIBP)	84-69-5	%(w/w)	0.003	ND
Dinonyl Phthalate (DNP)	84-76-4	%(w/w)	0.003	ND
Diisooctyl Phthalate (DIOP)	27554-26-3	%(w/w)	0.010	ND
Dipropyl Phthalate (DPrP)	131-16-8	%(w/w)	0.003	ND
Dicyclohexyl Phthalate (DCHP)	84-61-7	%(w/w)	0.003	ND
Di-n-pentyl Phthalate (DnPP)	131-18-0	%(w/w)	0.003	ND
Dibenzyl Phthalate (DBzP)	523-31-9	%(w/w)	0.003	ND
Diphenyl Phthalate (DPhP)	84-62-8	%(w/w)	0.003	ND
Di-n-hexyl Phthalate (DnHP)	84-75-3	%(w/w)	0.003	ND
Bis(2-methoxyethyl) Phthalate (DMEP)	117-82-8	%(w/w)	0.003	ND
Diallyl Phthalate (DAP)	131-17-9	%(w/w)	0.003	ND
1,2-Benzenedicarboxylic acid, dihexyl ester branched and linear(DHP)	68515-50-4	%(w/w)	0.010	ND
Dioctyl Terephthalate (DOTP)	6422-86-2	%(w/w)	0.003	ND
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP)	68515-42-4	%(w/w)	0.010	ND
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)	71888-89-6	%(w/w)	0.010	ND

Notes :

(1)DBP,BBP,DEHP Reference information: Entry 51 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 (previously restricted under Directive 2005/84/EC):
i) Shall not be used as substances or in mixtures, in concentrations greater than 0.1 % by weight of the plasticised material, in toys and childcare articles.
ii) Toys and childcare articles containing these phthalates in a concentration greater than 0.1 % by weight of the plasticised material shall not be placed on the market.
Please refer to Regulation (EC) No 552/2009 to get more detail information
(2)DINP, DNOP, DIDP Reference information: Entry 52 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 (previously restricted under Directive 2005/84/EC).
i) Shall not be used as substances or in mixtures, in concentrations greater than 0.1 % by weight of the plasticised material, in toys and childcare articles which can be placed in the mouth by children.
ii) Such toys and childcare articles containing these phthalates in a concentration greater than 0.1 % by

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weight of the plasticised material shall not be placed on the market.
Please refer to Regulation (EC) No 552/2009 to get more detail information

PFOA & PFOS (Perfluorooctanoic acid & Perfluorooctane sulfonates)

Test Method : With reference to CEN/TS15968:2010, analysis was performed by LC-MS.

Test Item(s)	CAS NO.	Unit	MDL	003
Perfluorooctanoic acid (PFOA)	335-67-1	mg/kg	10	ND
Perfluorooctane Sulfonates (PFOS)^	-	mg/kg	10	ND

Notes :

(1) ^ PFOS refer to Perfluorooctanesulfonic acid and its derivatives including Perfluoroctanesulfonic acid, Perfluoroctane sulfonamide, N-Methylperfluoroctane sulfonamide, N-Ethylperfluoroctane sulfonamide, N-Methylperfluoroctane sulfonamidoethanol and N-Ethylperfluoroctane sulfonamidoethanol.

Polycyclic Aromatic Hydrocarbons (PAHs)

Test Method : With reference to AfPS GS 2014:01 PAK, analysis was performed by GC-MS.

Test Item(s)	CAS NO.	Unit	MDL	003
Naphthalene(NAP)	91-20-3	mg/kg	0.1	ND
Acenaphthylene(ANY)	208-96-8	mg/kg	0.1	ND
Acenaphthene(ANA)	83-32-9	mg/kg	0.1	ND
Fluorene(FLU)	86-73-7	mg/kg	0.1	ND
Phenanthrene(PHE)	85-01-8	mg/kg	0.1	ND
Anthracene(ANT)	120-12-7	mg/kg	0.1	ND
Fluoranthene(FLT)	206-44-0	mg/kg	0.1	ND
Pyrene(PYR)	129-00-0	mg/kg	0.1	ND
Benzo(a)anthracene(BaA)	56-55-3	mg/kg	0.1	ND
Chrysene(CHR)	218-01-9	mg/kg	0.1	ND
Benzo(b)fluoranthene(BbF)	205-99-2	mg/kg	0.1	ND
Benzo(j)fluoranthene(BjF)	205-82-3	mg/kg	0.1	ND
Benzo(k)fluoranthene(BkF)	207-08-9	mg/kg	0.1	ND
Benzo(a)pyrene(BaP)	50-32-8	mg/kg	0.1	ND
Benzo(e)pyrene(BeP)	192-97-2	mg/kg	0.1	ND
Indeno(1,2,3-c,d)pyrene(IPY)	193-39-5	mg/kg	0.1	ND
Dibenzo(a,h)anthracene(DBA)	53-70-3	mg/kg	0.1	ND
Benzo(g,h,i)perylene(BPE)	191-24-2	mg/kg	0.1	ND

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Test Item(s)	CAS NO.	Unit	MDL	003
Sum of 7 PAHs Acenaphthylene. Acenaphthene, Fluorene, Phenanthrene, Pyrene, Anthracene, Fluoranthene	-	mg/kg	-	ND
Sum of 18 PAHs	-	mg/kg	-	ND

AfPS (German commission for Product Safety) : GS PAHs requirements

Parameter	Category 1	Category 2		Category 3	
	Material indented to be put in the mouth or toys with intended skin contact (longer than 30 s).	Materials not falling under category 1 with foreseeable contact to skin for longer than 30 s (long-term skin) or frequent contact.		Materials not falling under category 1 or 2 with foreseeable contact to skin for less than 30 s (short-term skin contact).	
		Toy under 2009/48/EC	Other products under ProdSG	Toy under 2009/48/EC	Other products under ProdSG
Benzo(a)pyrene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(e)pyrene Mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(a)anthracene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(b)fluoranthene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(j)fluoranthene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(k)fluoranthene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Chrysene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Dibenzo(a,h)anthracene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(g,h,i)perylene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Indeno(l,2,3-cd)pyrene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Acenaphthylene, Acenaphthene, fluorene,phenanthrene , pyrene, anthracene, fluoranthene, mg/kg	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum
Naphthalene, mg/kg	< 1	< 2		< 10	
Sum of 18 PAHs	<1	< 5	< 10	< 20	< 50

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Pb/Cd/Hg/Cr^{6+}/PBBs/PBDEs Testing Flow Chart

1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} and PBBs/PBDEs test method excluded).

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Phthalates Testing Flow Chart

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Halogen Testing Flow Chart

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Elementary Testing Flow Chart

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PFOA / PFOS Testing Flow Chart

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CYG CHANGTONG CO.,LTD.

CYG GUANGMING BASE,GUANGMING STREET,GUANGMING NEW AREA,SHENZHEN CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : Red,Yellow,Transparent blue

SGS Job No. :	CP16-045189 - SZ
Date of Sample Received :	15 Jul 2016
Testing Period :	15 Jul 2016 - 22 Jul 2016
Test Requested :	Selected test(s) as requested by client.
Test Method :	Please refer to next page(s).
Test Results :	Please refer to next page(s).

Signed for and on behalf of
SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

Alkene Liang
Approved Signatory

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	CAN16-138234.001	Red plastic tube+Yellow plastic tube+Blue plastic tube

Remarks :

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

Elementary Analysis, Flame Retardants & Phthalate(s)

Test Method : (1)With reference to IEC 62321-5:2013, determination of Cadmium by ICP-OES.
(2)With reference to IEC 62321-5:2013, determination of Lead by ICP-OES.
(3)With reference to IEC 62321-4:2013, determination of Mercury by ICP-OES.
(4)With reference to IEC 62321:2008, determination of Hexavalent Chromium by Colorimetric Method using UV-Vis.
(5)With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.
(6)With reference to IEC 62321-8:2013 (111/321/CD) , determination of phthalates by GC-MS.

Test Item(s)	Unit	MDL	*001*
Cadmium (Cd)	mg/kg	2	ND
Lead (Pb)	mg/kg	2	ND
Mercury (Hg)	mg/kg	2	ND
Hexavalent Chromium (CrVI)	mg/kg	2	ND
Sum of PBBs	mg/kg	-	ND
Monobromobiphenyl	mg/kg	5	ND
Dibromobiphenyl	mg/kg	5	ND
Tribromobiphenyl	mg/kg	5	ND
Tetrabromobiphenyl	mg/kg	5	ND
Pentabromobiphenyl	mg/kg	5	ND
Hexabromobiphenyl	mg/kg	5	ND
Heptabromobiphenyl	mg/kg	5	ND
Octabromobiphenyl	mg/kg	5	ND
Nonabromobiphenyl	mg/kg	5	ND
Decabromobiphenyl	mg/kg	5	ND
Sum of PBDEs	mg/kg	-	ND

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Test Item(s)	Unit	MDL	001
Monobromodiphenyl ether	mg/kg	5	ND
Dibromodiphenyl ether	mg/kg	5	ND
Tribromodiphenyl ether	mg/kg	5	ND
Tetrabromodiphenyl ether	mg/kg	5	ND
Pentabromodiphenyl ether	mg/kg	5	ND
Hexabromodiphenyl ether	mg/kg	5	ND
Heptabromodiphenyl ether	mg/kg	5	ND
Octabromodiphenyl ether	mg/kg	5	ND
Nonabromodiphenyl ether	mg/kg	5	ND
Decabromodiphenyl ether	mg/kg	5	ND
Dibutyl phthalate (DBP)	mg/kg	50	ND
Butyl benzyl phthalate (BBP)	mg/kg	50	ND
Bis (2-ethylhexyl) phthalate (DEHP)	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	mg/kg	50	ND

Halogen

Test Method : With reference to EN 14582: 2007, analysis was performed by Ion Chromatograph (IC).

Test Item(s)	Unit	MDL	001
Fluorine (F)	mg/kg	50	ND
Chlorine (Cl)	mg/kg	50	ND
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND

Elementary Analysis

Test Method : With reference to US EPA Method 3052:1996, analysis was performed by ICP-OES.

Test Item(s)	Unit	MDL	001
Arsenic (As)	mg/kg	10	ND
Antimony (Sb)	mg/kg	10	108

Hexabromocyclododecane (HBCDD)

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Test Method : With reference to IEC 62321:2008, analysis was performed by GC-MS.

Test Item(s)	Unit	MDL	*001*
Hexabromocyclododecane (HBCDD)	mg/kg	10	ND

Phthalate

Test Method : With reference to EN14372: 2004. Analysis was performed by GC-MS.

Test Item(s)	CAS NO.	Unit	MDL	001
Dibutyl Phthalate (DBP)	84-74-2	%(w/w)	0.003	ND
Benzylbutyl Phthalate (BBP)	85-68-7	%(w/w)	0.003	ND
Bis(2-ethylhexyl) Phthalate (DEHP)	117-81-7	%(w/w)	0.003	ND
Diisononyl Phthalate (DINP)	28553-12-0 / 68515-48-0	%(w/w)	0.010	ND
Di-n-octyl Phthalate (DNOP)	117-84-0	%(w/w)	0.003	ND
Diisodecyl Phthalate (DIDP)	26761-40-0 / 68515-49-1	%(w/w)	0.010	ND
Dimethyl Phthalate (DMP)	131-11-3	%(w/w)	0.003	ND
Diethyl Phthalate (DEP)	84-66-2	%(w/w)	0.003	ND
Diisobutyl Phthalate (DIBP)	84-69-5	%(w/w)	0.003	ND
Dinonyl Phthalate (DNP)	84-76-4	%(w/w)	0.003	ND
Diisooctyl Phthalate (DIOP)	27554-26-3	%(w/w)	0.010	ND
Dipropyl Phthalate (DPrP)	131-16-8	%(w/w)	0.003	ND
Dicyclohexyl Phthalate (DCHP)	84-61-7	%(w/w)	0.003	ND
Di-n-pentyl Phthalate (DnPP)	131-18-0	%(w/w)	0.003	ND
Dibenzyl Phthalate (DBzP)	523-31-9	%(w/w)	0.003	ND
Diphenyl Phthalate (DPhP)	84-62-8	%(w/w)	0.003	ND
Di-n-hexyl Phthalate (DnHP)	84-75-3	%(w/w)	0.003	ND
Bis(2-methoxyethyl) Phthalate (DMEP)	117-82-8	%(w/w)	0.003	ND
Diallyl Phthalate (DAP)	131-17-9	%(w/w)	0.003	ND
1,2-Benzenedicarboxylic acid, dihexyl ester branched and linear(DHP)	68515-50-4	%(w/w)	0.010	ND
Dioctyl Terephthalate (DOTP)	6422-86-2	%(w/w)	0.003	ND
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP)	68515-42-4	%(w/w)	0.010	ND
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)	71888-89-6	%(w/w)	0.010	ND

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Notes :

(1)DBP,BBP,DEHP Reference information: Entry 51 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 (previously restricted under Directive 2005/84/EC):
i) Shall not be used as substances or in mixtures, in concentrations greater than 0.1 % by weight of the plasticised material, in toys and childcare articles.
ii) Toys and childcare articles containing these phthalates in a concentration greater than 0.1 % by weight of the plasticised material shall not be placed on the market.
Please refer to Regulation (EC) No 552/2009 to get more detail information
(2)DINP, DNOP, DIDP Reference information: Entry 52 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 (previously restricted under Directive 2005/84/EC).
i) Shall not be used as substances or in mixtures, in concentrations greater than 0.1 % by weight of the plasticised material, in toys and childcare articles which can be placed in the mouth by children.
ii) Such toys and childcare articles containing these phthalates in a concentration greater than 0.1 % by weight of the plasticised material shall not be placed on the market.
Please refer to Regulation (EC) No 552/2009 to get more detail information

PFOA & PFOS (Perfluorooctanoic acid & Perfluorooctane sulfonates)

Test Method : With reference to CEN/TS15968:2010, analysis was performed by LC-MS.

Test Item(s)	CAS NO.	Unit	MDL	001
Perfluoroctanoic acid (PFOA)	335-67-1	mg/kg	10	ND
Perfluorooctane Sulfonates (PFOS)^	-	mg/kg	10	ND

Notes :

(1) ^ PFOS refer to Perfluorooctanesulfonic acid and its derivatives including Perfluoroctanesulfonic acid, Perfluoroctane sulfonamide, N-Methylperfluoroctane sulfonamide, N-Ethylperfluoroctane sulfonamide, N-Methylperfluoroctane sulfonamidoethanol and N-Ethylperfluoroctane sulfonamidoethanol.

Polycyclic Aromatic Hydrocarbons (PAHs)

Test Method : With reference to AfPS GS 2014:01 PAK, analysis was performed by GC-MS.

Test Item(s)	CAS NO.	Unit	MDL	001
Naphthalene(NAP)	91-20-3	mg/kg	0.1	ND
Acenaphthylene(ANY)	208-96-8	mg/kg	0.1	ND
Acenaphthene(ANA)	83-32-9	mg/kg	0.1	ND
Fluorene(FLU)	86-73-7	mg/kg	0.1	ND
Phenanthrene(PHE)	85-01-8	mg/kg	0.1	ND
Anthracene(ANT)	120-12-7	mg/kg	0.1	ND
Fluoranthene(FLT)	206-44-0	mg/kg	0.1	ND

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Test Item(s)	CAS NO.	Unit	MDL	001
Pyrene(PYR)	129-00-0	mg/kg	0.1	ND
Benzo(a)anthracene(BaA)	56-55-3	mg/kg	0.1	ND
Chrysene(CHR)	218-01-9	mg/kg	0.1	ND
Benzo(b)fluoranthene(BbF)	205-99-2	mg/kg	0.1	ND
Benzo(j)fluoranthene(BjF)	205-82-3	mg/kg	0.1	ND
Benzo(k)fluoranthene(BkF)	207-08-9	mg/kg	0.1	ND
Benzo(a)pyrene(BaP)	50-32-8	mg/kg	0.1	ND
Benzo(e)pyrene(BeP)	192-97-2	mg/kg	0.1	ND
Indeno(1,2,3-c,d)pyrene(IPY)	193-39-5	mg/kg	0.1	ND
Dibenzo(a,h)anthracene(DBA)	53-70-3	mg/kg	0.1	ND
Benzo(g,h,i)perylene(BPE)	191-24-2	mg/kg	0.1	ND
Sum of 7 PAHs Acenaphthylene. Acenaphthene, Fluorene, Phenanthrene, Pyrene, Anthracene, Fluoranthene	-	mg/kg	-	ND
Sum of 18 PAHs	-	mg/kg	-	ND

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AfPS (German commission for Product Safety) : GS PAHs requirements

Parameter	Category 1	Category 2		Category 3	
	Material indented to be put in the mouth or toys with intended skin contact (longer than 30 s).	Materials not falling under category 1 with foreseeable contact to skin for longer than 30 s (long-term skin) or frequent contact.		Materials not falling under category 1 or 2 with foreseeable contact to skin for less than 30 s (short-term skin contact).	
		Toy under 2009/48/EC	Other products under ProdSG	Toy under 2009/48/EC	Other products under ProdSG
Benzo(a)pyrene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(e)pyrene Mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(a)anthracene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(b)fluoranthene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(j)fluoranthene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(k)fluoranthene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Chrysene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Dibenzo(a,h)anthracene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(g,h,i)perylene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Indeno(l,2,3-cd)pyrene mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Acenaphthylene, Acenaphthene, fluorene,phenanthrene , pyrene, anthracene, fluoranthene, mg/kg	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum
Naphthalene, mg/kg	< 1	< 2		< 10	
Sum of 18 PAHs	<1	< 5	< 10	< 20	< 50

Remark 1: Results shown are of the total weight of mixed samples.
Remark 2: The sample(s) was/were analyzed on behalf of the applicant as mixing sample in one testing. The above result(s) was/were only given as the informality value and only for reference.

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ATTACHMENTS

Pb/Cd/Hg/Cr^{6+}/PBBs/PBDEs Testing Flow Chart

1) Name of the person who made testing: Bruce Xiao / Sunny Hu
2) Name of the person in charge of testing: Bella Wang / Cutey Yu
3) These samples were dissolved totally by pre-conditioning method according to below flow chart (Cr^{6+} and PBBs/PBDEs test method excluded).

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ATTACHMENTS

Phthalates Testing Flow Chart

1) Name of the person who made testing: Sunny Hu
2) Name of the person in charge of testing: Cutey Yu

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Halogen Testing Flow Chart

1) Name of the person who made testing: Hanming Xiao
2) Name of the person in charge of testing: Bella Wang

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HBCDD Testing Flow Chart

1) Name of the person who made testing: Sunny Hu
2) Name of the person in charge of testing: Cutey Yu

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PFOA / PFOS Testing Flow Chart

1) Name of the person who made testing: Zhihong Wang
2) Name of the person in charge of testing: Cutey Yu

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PAHs Testing Flow Chart

1) Name of the person who made testing: Sunny Hu
2) Name of the person in charge of testing: Cutey Yu

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Elementary Testing Flow Chart

1) Name of the person who made testing : Bruce Xiao
2) Name of the person in charge of testing : Bella Wang

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SGS authenticate the photo on original report only

*** End of Report ***

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YDQS2.E360047
Tubing, Flame Retardant - Component

Page Bottom

Tubing, Flame Retardant - Component

See General Information for Tubing, Flame Retardant - Component

CYG CHANGTONG CO LTD E360047
Bldg B&C Haoxuan Industrial Park 1St
Industrial District Loucun Community
Gongming Agency Guangming District
Shenzhen, Guangdong 518107 CHINA

Polyethylene terephthalate (PET) tubings, Model(s) CTZD-01, CTZR-01

Marking: Company name, catalog designation and "VW-1" on the outside of the spool and on a separate tag on each end of the coated sleeving, or on the bundling wrapper or on the outside of the smallest unit container in which the product is packaged.

Last Updated on 2016-10-13

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8.

熱收縮套管
SGS報告書

HAMBURG INDUSTRIES CO.,LTD

6FL, No.12, Lane 270, Sec.3, Pei Shen Rd., Shen Keng Hsiang, Taipei Hsien, Taiwan 222

PRODUCT SPECIFICATION

HAMBURG H-2 環保阻燃熱收縮套管(無鹵)

Halogen free, environmentally friendly, flexible, flame-retardant polyolefin tubing

■ 應用

HAMBURG H-2 系柔軟、無鹵阻燃、輻照交聯聚烯烴復合物制成之優質環保型熱收縮套管，通過 UL 及 CSA 認證。該產品不含任何鹵素阻燃劑，不含有氯化合物 PCBs、PCPs 及多溴聯苯 PBBs、多溴氧化聯苯 PBBOs、多溴聯苯醚 PBBEs、PBDEs 等危害環境的物質，符合歐洲 RoHS 環保指令及 SONY SS00259 標準的環保要求。廣泛應用于線纜絕緣保護、端末或連接處的絕緣處理或應力解除，線材加工的被覆與絕緣保護，焊點保護、電子元器件的包覆，電阻、電容的絕緣保護、金屬產品的防鏽、防腐蝕處理，電線標示或標色等。

■ 特點

◎收縮比 2：1
◎低溫收縮
◎柔軟、高阻燃
◎優異的物理、化學及電學性能
◎不含鹵素阻燃劑，不含氯化合物 PCBs、PCPs 及多溴聯苯 PBBs、多溴氧化聯苯 PBBOs、多溴聯苯醚 PBBEs、PBDEs 等對環境有害的物質，符合歐洲 RoHS 環保指令及 SONY SS00259 標準的環保要求。
◎可提供多種規格及顏色

■ 熱收縮性能

◎ 連續使用的環境溫度：-55℃~125℃
◎ 起始收縮溫度：70℃
◎ 完全收縮溫度：125℃
◎ 縱向收縮率：≦5%

■ 認證 / 符合標準

◎ UL224 E255394 125℃ 600V VW-1
◎ CSA C22.2 238014 125℃ 600V VW-1

■ Application

HAMBURG H-2 is halogen free, environmentally friendly, flexible, flame-retardant, irradiated crosslinking heat-shrinkable modified polyolefin tubing. It contains no added halogens, and is free of PCBs, PCBs, polybrominated biphenyls (PBBs), polybrominated biphenyl oxides and others (PBBOs, PBBEs and PBDEs) and toxic heavy metal (Pb, Cd, Hg, Cr^{6+}) compounds, which are classified as environmentally hazardous substances. This high-reliability product is widely used for insulation or jacketing of wire harness, strain relief of wire terminations and connections, bundling of wire harness, protection of soldered points, insulation and capsule of electronic components, anti-corrosive protection, identification and color coding, etc.

■ Features/Benefits

◎Shrink ration:2:1
◎Low shrink temperature
◎Very flexible, flame-retardant
◎Good thermal stability
◎Excellent physical, chemical and electrical properties
◎No added halogens, free of PCBs, PCBs, polybrominated biphenyls (PBBs), polybrominated biphenyl oxides and others (PBBOs, PBBEs, and PBDEs) and toxic heavy metal (Pb, Cd, Hg, Cr6+) compounds, which are classified as environmentally hazardous substances, Conforms to European RoHS environmental directive.
◎Wide range of sizes and colors

■ Heat shrinking property

◎Temperature range: -55℃~125℃
◎Shrinking temperature: 70℃
◎Full recovery temperature: 125℃
◎Longitudinal shrinking: ≦5%

■ Standards/Approvals

◎UL224 E255394 125℃ 600V VW-1
◎CSA C22.2 238014 125℃ 600V VW-1

For further information,please contact:
Tel: 886 2 2662 8882 Fax: 886 2 2662 7201~2 E-mail: Taipei@hamburg.com.tw URL: http://www.hamburg.com.tw

HAMBURG INDUSTRIES CO.,LTD

6FL, No.12, Lane 270, Sec.3, Pei Shen Rd., Shen Keng Hsiang, Taipei Hsien, Taiwan 222

■ 性能特性 Property

性能 Property		單位 Unit	測試方法 Test method	性能指標 Standard
物理性能 Physical	拉伸強度 Tensile strength	Mpa	GB/T1040	≧10.4
	斷裂伸長率 Elongation	%	GB/T1040	≧200
	熱老化後拉伸強度 Tensile strength after aging	Mpa	UL224 158℃x168hr	≧7.3
	熱老化後斷裂伸長率 Elongation after aging	%	UL224 158℃x168hr	≧100
	耐熱沖擊 Heat Resistance	-	UL224 250℃x4hr	不發粘，不龜裂 No viscidity, No cracking
	抗冷彎曲 Cold blend	-	UL224 -30℃x4hr	不龜裂 No cracking
電氣性能 Electrical	擊穿強度 Dielectric strength	KV/mm	GB/T1408	≧15
	耐壓 Dielectric withstand	V	UL224	2500V 不擊穿 No breaking for 2500V
	體積電阻率 Volume resistance	Ω・cm	GB/T1410	≧$1x10^{14}$
化學性能 Chemical	抗腐蝕性 Anti Corrosion	-	UL224 158℃x168hr	通過 Pass
	銅安定性 Copper stability	-	UL224 158℃x168hr	通過 Pass
	阻燃性 Flammability	-	UL224	VW-1

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HAMBURG INDUSTRIES CO.,LTD

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■ 規格尺寸 Product sizes

規格 Size(mm)	收縮前(mm) As supplied		收縮後(mm) After recovery		包裝(米/捲) Packing (M/Spool)	適用範圍 Application (mm)
	內徑(I.D.) Inside diameter	壁厚(W.T.) Wall thickness	內徑(I.D.) Inside diameter	壁厚(W.T.) Wall Thickness		
Φ0.5	0.8 ± 0.2	0.15 ± 0.05	≦0.30	0.22 ± 0.10	400	0.4~0.7
Φ0.6	0.9 ± 0.2	0.15 ± 0.05	≦0.40	0.22 ± 0.10	400	0.5~0.7
Φ0.8	1.1 ± 0.2	0.15 ± 0.05	≦0.50	0.22 ± 0.10	400	0.6~0.8
Φ1.0	1.5 ± 0.2	0.15 ± 0.05	≦0.65	0.28 ± 0.10	400	0.75~0.9
Φ1.5	2.0 ± 0.2	0.18 ± 0.05	≦0.90	0.32 ± 0.10	400	0.95~1.4
Φ2.0	2.5 ± 0.2	0.18 ± 0.05	≦1.00	0.35 ± 0.10	400	1.1~1.8
Φ2.5	3.0 ± 0.2	0.18 ± 0.05	≦1.30	0.38 ± 0.10	400	1.35~2.3
Φ3.0	3.5 ± 0.2	0.18 ± 0.05	≦1.50	0.40 ± 0.10	400	1.6~2.7
Φ3.5	4.0 ± 0.2	0.22 ± 0.05	≦1.80	0.42 ± 0.10	400	1.85~3.2
Φ4.0	4.5 ± 0.2	0.25 ± 0.05	≦2.00	0.45 ± 0.10	400	2.1~3.6
Φ4.5	5.0 ± 0.2	0.25 ± 0.05	≦2.30	0.50 ± 0.10	200	2.35~4.0
Φ5.0	5.5 ± 0.2	0.25 ± 0.05	≦2.50	0.55 ± 0.10	200	2.6~4.5
Φ6.0	6.5 ± 0.2	0.28 ± 0.05	≦3.00	0.55 ± 0.10	200	3.1~5.4
Φ7.0	7.5 ± 0.3	0.28 ± 0.05	≦3.50	0.55 ± 0.10	100	3.7~6.3
Φ8.0	8.5 ± 0.3	0.28 ± 0.05	≦4.00	0.60 ± 0.10	100	4.2~7.2
Φ9.0	9.5 ± 0.3	0.30 ± 0.08	≦4.50	0.60 ± 0.10	100	4.7~8.0
Φ10.0	10.5 ± 0.3	0.30 ± 0.08	≦5.00	0.60 ± 0.10	100	5.2~9.0
Φ11.0	11.5 ± 0.3	0.30 ± 0.08	≦5.50	0.60 ± 0.10	100	5.7~10.0
Φ12.0	12.5 ± 0.3	0.30 ± 0.08	≦6.00	0.60 ± 0.10	100	6.2~11.0
Φ13.0	13.5 ± 0.3	0.35 ± 0.10	≦6.50	0.65 ± 0.10	100	6.7~12.0
Φ14.0	14.5 ± 0.3	0.35 ± 0.10	≦7.00	0.65 ± 0.10	100	7.3~13.0
Φ15.0	15.5 ± 0.4	0.40 ± 0.12	≦7.50	0.70 ± 0.10	100	7.8~14.0
Φ16.0	16.5 ± 0.4	0.40 ± 0.12	≦8.00	0.70 ± 0.10	100	8.3~15.0
Φ17.0	17.5 ± 0.4	0.40 ± 0.12	≦8.50	0.70 ± 0.10	100	8.8~16.0
Φ18.0	19.0 ± 0.5	0.40 ± 0.15	≦9.00	0.80 ± 0.15	100	9.3~17.0
Φ20.0	22.0 ± 0.5	0.40 ± 0.15	≦10.00	0.80 ± 0.15	100	10.4~19.0
Φ22.0	24.0 ± 0.5	0.40 ± 0.15	≦11.00	0.80 ± 0.15	100	11.4~21.0
Φ25.0	26.0 ± 0.5	0.50 ± 0.15	≦12.50	0.90 ± 0.15	50	12.8~24.0
Φ28.0	29.0 ± 0.5	0.50 ± 0.15	≦14.00	0.90 ± 0.15	50	14.4~29.0
Φ30.0	31.5 ± 1.0	0.50 ± 0.15	≦15.00	0.95 ± 0.15	50	16.0~29.0
Φ35.0	36.5 ± 1.0	0.50 ± 0.15	≦17.50	1.00 ± 0.15	50	18.0~34.0
Φ40.0	41.5 ± 1.0	0.55 ± 0.15	≦20.00	1.00 ± 0.15	50	21.0~39.0
Φ45.0	46.5 ± 1.0	0.55 ± 0.15	≦22.50	1.00 ± 0.15	25	23.5~44.0
Φ50.0	≧50	0.55 ± 0.15	≦25.00	1.00 ± 0.15	25	26.0~49.0

■ Ordering Information

◎Color: Black.

other colors are available upon request.

◎Nonstandard size: Special sizes are available upon request.

◎Standard packaging: On spools, Cut pieces are available upon request.

◎Ordering description: Specify product type, size (mm or inch) and color.

For further information,please contact:

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PRODUCT SPECIFICATION

HAMBURG H-2(CB) 環保阻燃薄壁熱收縮套管(無鹵)

Halogen free, environmentally friendly, ultra thin-wall, flame-retardant polyolefin tubing

■ 應用

HAMBURG H-2(CB)系柔軟、無鹵阻燃、輻照交聯聚烯烴復合物制成之環保超薄型熱收縮套管，通過 UL 及 CSA 認證。H-2(CB)系超薄設計，快速收縮，特別適用于空間緊張和對溫度敏感的場合。例如，高密度連接器的應力解除，輕、薄、小、熱敏元件的絕緣保護等。H-2(CB) 不含鹵素阻燃劑，不含 PCBs、PCPs、PBBs、PBBOs、PBBEs、PBDEs 等對環境有害的物質、符合環保要求。

■ 特點

◎收縮比 2：1

◎低溫收縮、快速收縮

◎柔軟、高阻燃

◎優異的物理、化學及電學性能

◎不含鹵素阻燃劑，不含 PCBs、PCPs、PBBs、PBBOs、PBBEs、PBDEs 等對環境有害的物質，符合歐洲 RoHS 環保指令及 SONY SS00259 標準的要求。

◎可提供多種規格及顏色

■ 熱收縮性能

◎ 連續使用環境溫度：-55℃~125℃

◎ 起始收縮溫度：70℃

◎ 完全收縮溫度：125℃

◎ 縱向收縮率：≦5%

■ 認證 / 符合標準

◎UL224 E255394 125℃ 300V VW-1

◎CSA C22.2 238014 125℃ 150V VW-1

■ Application

HAMBURG H-2(CB) is halogen free, environmentally friendly, flexible, ultra thin-wall, flexible, flame-retardant, irradiated cross-linking heat-shrinkable modified polyolefin tubing, It is designed for applications that require an ultra thin wall for rapid shrinking and space saving. Low shrink temperature further reduces installation time and the risk of damage to temperature-sensitive components.

■ Features/Benefits

◎Shrink ration:2:1

◎Low shrink temperature

◎Ultra thin-wall, rapid shrinking.

◎Very flexible, flame-retardant

◎No added halogens, free of PCBs, PCPs, polybrominated biphenyls (PBBs), polybrominated biphenyl oxides and others (PBBOs, PBBEs, and PBDEs) and toxic heavy metal (Pb, Cd, Hg, Cr6+) compounds, which are classified as environmentally hazardous substances. Conforms to European RoHS environmental directive.

◎Wide range of sizes and colors

■ Heat shrinking property

◎Temperature range: -55℃~125℃

◎Shrink temperature: 70℃

◎Full recovery temperature: 125℃

◎Longitudinal shrinking: ≦5%

■ Standards/Approvals

◎UL224 E255394 125℃ 300V VW-1

◎CSA C22.2 238014 125℃ 150V VW-1

For further information,please contact:
Tel: 886 2 2662 8882 Fax: 886 2 2662 7201~2 E-mail: Taipei@hamburg.com.tw URL: http://www.hamburg.com.tw

HAMBURG INDUSTRIES CO.,LTD

6FL, No.12, Lane 270, Sec.3, Pei Shen Rd., Shen Keng Hsiang, Taipei Hsien, Taiwan 222

■ 性能特性 Property

性能 Property		單位 Unit	測試方法 Test method	性能指標 Typical data
物理性能 Physical	拉伸強度 Tensile strength	Mpa	GB/T1040	≧10.4
	斷裂伸長率 Elongation	%	GB/T1040	≧200
	熱老化後拉伸強度 Tensile strength after aging	Mpa	UL224 158℃x168hr	≧7.3
	熱老化後斷裂伸長率 Elongation after aging	%	UL224 158℃x168hr	≧100
	耐熱沖擊 Heat Resistance	-	UL224 250℃x4hr	不發粘,不龜裂 No viscidity, No cracking
	抗冷彎曲 Cold blend	-	UL224 -30℃x4hr	不龜裂 No cracking
電氣性能 Electrical	擊穿強度 Dielectric strength	KV/mm	GB/T1408	≧15
	耐壓 Dielectric withstand	V	UL224	1500V 不擊穿 No breaking for 1500V
	體積電阻率 Volume resistance	Ω・cm	GB/T1410	≧$1x10^{14}$
化學性能 Chemical	抗腐蝕性 Anti Corrosion	-	UL224 158℃x168hr	通過 Pass
	銅安定性 Copper stability	-	UL224 158℃x168hr	通過 Pass
	阻燃性 Flammability	-	UL224	VW-1

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■ 規格尺寸 Product sizes

規格 Size(mm)	收縮前(mm) As supplied		收縮後(mm) After recovery		包裝(米/捲) Packing (M/Spool)	適用範圍 Application (mm)
	內徑(I.D.) Inside diameter	壁厚(W.T.) Wall thickness	內徑(I.D.) Inside diameter	壁厚(W.T.) Wall thickness		
Φ0.6	0.9 ± 0.2	0.13 ± 0.05	≦0.40	0.20 ± 0.10	400	0.4~0.7
Φ0.8	1.1 ± 0.2	0.13 ± 0.05	≦0.50	0.20 ± 0.10	400	0.6~0.8
Φ1.0	1.4 ± 0.2	0.13 ± 0.05	≦0.65	0.20 ± 0.10	400	0.7~1.0
Φ1.5	1.9 ± 0.2	0.13 ± 0.05	≦0.90	0.20 ± 0.10	400	0.9~1.4
Φ2.0	2.4 ± 0.2	0.13 ± 0.05	≦1.00	0.22 ± 0.10	400	1.1~1.8
Φ2.5	2.9 ± 0.2	0.13 ± 0.05	≦1.30	0.25 ± 0.10	400	1.4~2.3
Φ3.0	3.4 ± 0.2	0.13 ± 0.05	≦1.50	0.28 ± 0.10	400	1.6~2.7
Φ3.5	3.9 ± 0.2	0.13 ± 0.05	≦1.80	0.28 ± 0.10	400	1.9~3.2
Φ4.0	4.4 ± 0.2	0.15 ± 0.05	≦2.00	0.30 ± 0.10	400	2.1~3.6
Φ4.5	4.9 ± 0.2	0.15 ± 0.05	≦2.30	0.30 ± 0.10	200	2.4~4.0
Φ5.0	5.5 ± 0.2	0.15 ± 0.05	≦2.50	0.32 ± 0.10	200	2.6~4.5
Φ6.0	6.5 ± 0.2	0.15 ± 0.05	≦3.00	0.32 ± 0.10	200	3.1~5.4
Φ7.0	7.5 ± 0.3	0.15 ± 0.05	≦3.50	0.32 ± 0.10	200	3.7~6.3
Φ8.0	8.5 ± 0.3	0.15 ± 0.05	≦4.00	0.32 ± 0.10	200	4.2~7.2
Φ9.0	9.5 ± 0.3	0.15 ± 0.05	≦4.50	0.35 ± 0.10	200	4.7~8.0
Φ10.0	10.5 ± 0.3	0.15 ± 0.05	≦5.00	0.35 ± 0.10	200	5.2~9.0
Φ11.0	11.5 ± 0.3	0.18 ± 0.05	≦5.50	0.40 ± 0.10	200	5.7~10.0
Φ12.0	12.5 ± 0.3	0.20 ± 0.05	≦6.00	0.40 ± 0.10	200	6.2~11.0
Φ13.0	13.5 ± 0.3	0.20 ± 0.05	≦6.50	0.40 ± 0.10	200	6.7~12.0
Φ14.0	14.5 ± 0.3	0.20 ± 0.05	≦7.00	0.40 ± 0.10	200	7.3~13.0
Φ15.0	15.5 ± 0.4	0.20 ± 0.05	≦7.50	0.40 ± 0.10	200	7.8~14.0
Φ16.0	16.5 ± 0.4	0.22 ± 0.05	≦8.00	0.40 ± 0.10	200	8.3~15.0
Φ17.0	17.5 ± 0.4	0.22 ± 0.05	≦8.50	0.40 ± 0.10	200	8.8~16.0
Φ18.0	18.5 ± 0.4	0.22 ± 0.05	≦9.00	0.42 ± 0.10	200	9.3~17.0
Φ20.0	20.5 ± 0.5	0.25 ± 0.05	≦10.00	0.45 ± 0.10	200	10.5~19.0
Φ22.0	22.5 ± 0.5	0.25 ± 0.05	≦11.00	0.45 ± 0.10	200	11.5~20.5
Φ25.0	25.5 ± 0.5	0.25 ± 0.05	≦12.50	0.45 ± 0.10	100	13.0~24.0

HAMBURG H-2(CB) V1.5

■ Ordering Information

◎Color: Black

Other colors are available upon request.

◎Nonstandard size: Special sizes are available upon request.

◎Standard packaging: On spools, Cut pieces are available upon request.

◎Ordering description: Specify product type, size (mm or inch) and color.

For further information,please contact:

Tel: 886 2 2662 8882 Fax: 886 2 2662 7201~2 E-mail: Taipei@hamburg.com.tw URL: http://www.hamburg.com.tw

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Tubing, Extruded Insulating - Component

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Tubing, Extruded Insulating - Component

See General Information for Tubing, Extruded Insulating - Component

HAMBURG INDUSTRIES CO LTD E255394
6TH FL
12 LANE 270 PEI SHEN RD, SEC 3
SHEN KENG HSIANG, TAIPEI HSIEN 222 TAIWAN

Cat. No.	Max V	Max Oper Temp	Shrinkdown Class	Col Recognized	Max Temp Rated Oil Resistance * C	VW-1 Rated #
Heat-Shrinkable Polyolefin tubing.						
H-2	600	125	—	All except Clear	None	Yes

Cat. No.	Max V	Max Temp C	Col Recognized	Max Temp Rated Oil Resistance C	VW-1 Rated #
Flexible Heat-Shrinkable Polyolefin Tubing					
H-2(CB)	300	125	All except Clear	None	Yes

#Tubing is considered to comply with the optional VW-1 flammability requirements only if it is so marked.

VW-1 flammability rating limited to Black color only.

Marking: Company name or file number "E255394" , catalog designation, temperature rating in degrees C, voltage rating, inside diameter (before and after recovery), date of manufacture and Recognized Component Mark appear on tags attached to both ends of the tubing or on the shipping spool label or smallest unit container.

Last Updated on 2010-04-06

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Tubing, Extruded Insulating Certified for Canada - Component

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Tubing, Extruded Insulating Certified for Canada - Component

See General Information for Tubing, Extruded Insulating Certified for Canada - Component

HAMBURG INDUSTRIES CO LTD E255394
6TH FL
12 LANE 270 PEI SHEN RD, SEC 3
SHEN KENG HSIANG, TAIPEI HSIEN 222 TAIWAN

Cat. No.	Max V	Max Oper Temp	Shrinkdown Class	Col Recognized	Max Temp Rated Oil Resistance * C	VW-1 Rated #
Flexible Heat Shrinkable Polyolefin tubing.						
H-2	600	125	—	All except Clear	None	Yes

Cat. No.	Max V	Max Temp C	Col Recognized	Max Temp Rated Oil Resistance C	VW-1 Rated #
Flexible Heat-Shrinkable Polyolefin Tubing					
H-2(CB)	300	125	All except Clear	None	Yes

* - Tubing is considered to comply with the optional oil resistant requirements only if it is so marked.

#Tubing is considered to comply with the optional VW-1 flammability requirements only if it is so marked.

- VW-1 flammability rating limited to Black color only.

Marking: Company name or file number "E255394", catalog designation or equivalent temperature rating in degrees C and the Recognized Component Mark for Canada on tags attached to both ends of the tubing or on the shipping spool label or smallest unit container.

Last Updated on 2010-04-06

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CSA INTERNATIONAL

Certificate of Compliance

Certificate: 1868164

Master Contract: 238014

Project: 1868164

Date Issued: January 10, 2007

Issued to: Hamburg Industries Co., Ltd.
6F., No. 12, Lane 270, Sec. 3
Pei Shen Rd., Shen Keng Hsiang
Taipei Hsien, 222
Taiwan

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US'

C US

Authorized by: Fred Mark, P. Eng.,
Area Director, Asia

PRODUCTS

CLASS 9032 01 - INSULATING DEVICES AND MATERIALS-Insulating Tubing and Sleeving
CLASS 9032 81 - INSULATING DEVICES AND MATERIALS-Insulating Tubing and Sleeving - Certified to US Standards

Flexible, cross-linked, heat-shrinkable, polyolefin tubing

Cat No	Voltage Rating (V)	Temp Rating (C)	Size US Customary Sizes Recovered (mm)	Optional Flame (VW-1)	Notes
HAMBURG H-2	600	125	0.58-76.2	Yes	1

Note: In all colors except clear or translucent.

檢測報告
Test Report

報告編號 A2190023615189001E
Report No. A2190023615189001E

申請單位 漢保實業股份有限公司
Applicant HAMBURG INDUSTRIES CO.,LTD.
地　　址 222 新北市深坑區北深路三段 270 巷 12 號 6 樓
Address 6F., NO.12, LANE 270, SEC.3, PEISHEN RD., SHEN KENG DISTRICT, NEW TAIPEI CITY, TAIWAN 222

以下測試之樣品及樣品信息由申請者提供並確認
The following sample(s)and sample information was/were submitted and identified by/on the behalf of the client

樣品名稱 Sample Name	環保阻燃熱收縮套管(無鹵)Heat Shrinkable Polyolefin Tubing (Halogen Free)
客戶參考信息 Client Reference Information	HAMBURG-A H-2& H-2(CB)
樣品批號 Item No.	19011006884
材料名稱 Material	Polyolefin
樣品接收日期 Sample Received Date	2019.03.21 Mar. 21, 2019
樣品檢測日期 Testing Period	2019.03.21-2019.03.29 Mar. 21, 2019 to Mar. 29, 2019
檢測要求 Test Requested	根據客戶要求，參照法規(EC) No 1907/2006(REACH)，對所提交樣品中 197 種高關注物質(SVHC)進行篩選測試。 As specified by client, to screen the 197 substances of very high concern (SVHC) under Regulation(EC) No 1907/2006 of REACH in the submitted sample(s).
檢測依據/檢測結果 Test Method/Test Result(s)	請參見下頁。 Please refer to the following page(s).
摘要 Summary	根據分析結果，所提交樣品中 197 種 SVHC 濃度均小於 0.1%(w/w)。 According to the analytical results, concentrations of 197 SVHC substances are all less than 0.1%(w/w) in the submitted sample(s).

主　檢 Tested by 张孝瑜　　審　核 Reviewed by 陈瑞

批　准 Approved by 陳凱敏　　日　期 Date 2019.03.29

陳凱敏
實驗室經理 Lab Manager

No. T172791154

上海華測品標檢測技術有限公司
Centre Testing International Pinbiao(Shanghai) Co., Ltd.

上海市浦東新區新金橋路 1996 號
No. 1996, Xinjinqiao Road, Pudong New District, Shanghai,China

檢測報告
Test Report

檢測結果Test Result(s)

批次 Batch	序號 No.	物質名稱 Substance Name(s)	CAS 號 CAS No.	EC 號 EC No.	濃度 Concentration (%)	報告檢出限 Report Limit
I	1	蒽 Anthracene	120-12-7	204-371-1	N.D.	0.005%
I	2	4,4'-二氨基二苯基甲烷 4,4'- Diaminodiphenylmethane	101-77-9	202-974-4	N.D.	0.005%
I	3	鄰苯二甲酸二丁酯 Dibutyl phthalate(DBP)	84-74-2	201-557-4	N.D.	0.005%
I	4	二氯化鈷 Cobalt dichloride*	7646-79-9	231-589-4	N.D.	0.01%
I	5	五氧化二砷 Diarsenicpentaoxide*	1303-28-2	215-116-9	N.D.	0.01%
I	6	三氧化二砷 Diarsenic trioxide*	1327-53-3	215-481-4	N.D.	0.01%
I	7	重鉻酸鈉 Sodium dichromate*	7789-12-0 10588-01-9	234-190-3	N.D.	0.01%
I	8	二甲苯麝香 Musk xylene	81-15-2	201-329-4	N.D.	0.005%
I	9	鄰苯二甲酸二(2-乙基己基)酯 Bis(2-ethyl(hexyl)phthalate) (DEHP)	117-81-7	204-211-0	N.D.	0.005%
I	10	六溴環十二烷 Hexabromocyclododecane (HBCDD)	25637-99-4 3194-55-6 (134237-50-6) (134237-51-7) (134237-52-8)	247-148-4 221-695-9	N.D.	0.005%
I	11	短鏈氯化石蠟 Short Chain Chlorinated Paraffins(SCCPs)	85535-84-8	287-476-5	N.D.	0.01%
I	12	三丁基氧化錫 Bis(tributyltin)oxide (TBTO)*	56-35-9	200-268-0	N.D.	0.005%
I	13	砷酸氫鉛 Lead hydrogen arsenate*	7784-40-9	232-064-2	N.D.	0.01%
I	14	鄰苯二甲酸丁基苄酯 Benzyl butyl phthalate(BBP)	85-68-7	201-622-7	N.D.	0.005%
I	15	三乙基砷酸酯 Triethyl arsenate*	15606-95-8	427-700-2	N.D.	0.01%
II	16	①蒽油 Anthracene oil	90640-80-5	292-602-7	N.D.	0.05%
II	17	①蒽油,蒽糊,輕油 Anthracene oil, anthracene paste,distn. Lights ****	91995-17-4	295-278-5	N.D.	0.05%

檢測報告
Test Report

批次 Batch	序號 No.	物質名稱 Substance Name(s)	CAS 號 CAS No.	EC 號 EC No.	濃度 Concentration (%)	報告檢出限 Report Limit
II	18	①蒽油,蒽糊,蒽餾分 Anthracene oil, anthracene paste,anthracene fraction	91995-15-2	295-275-9	N.D.	0.05%
II	19	①蒽油,含蒽量少 Anthracene oil, anthracene-low	90640-82-7	292-604-8	N.D.	0.05%
II	20	①蒽油,蒽糊 Anthracene oil, anthracene paste	90640-81-6	292-603-2	N.D.	0.05%
II	21	①煤焦油瀝青,高溫 Coal tar pitch, high temperature	65996-93-2	266-028-2	N.D.	0.05%
II	22	丙烯醯胺 Acrylamide	79-06-1	201-173-7	N.D.	0.01%
II	23	2,4-二硝基甲苯 2,4-Dinitrotoluene	121-14-2	204-450-0	N.D.	0.01%
II	24	鄰苯二甲酸二異丁酯 Diisobutyl phthalate (DIBP)	84-69-5	201-553-2	N.D.	0.005%
II	25	②鉻酸鉛 Lead chromate	7758-97-6	231-846-0	N.D.	0.05%
II	26	②鉬鉻紅(C.I.顏料紅 104) Lead chromate molybdatesulphate red (C.I. Pigment Red 104)***	12656-85-8	235-759-9	N.D.	0.05%
II	27	②鉛鉻黃(C.I.顏料黃 34) Lead sulfochromate yellow(C.I. Pigment Yellow 34)***	1344-37-2	215-693-7	N.D.	0.05%
II	28	磷酸三(2-氯乙基)酯 Tris(2-chloroethyl)phosphate (TCEP)	115-96-8	204-118-5	N.D.	0.01%
III	29	三氯乙烯 Trichloroethylene	79-01-6	201-167-4	N.D.	0.005%
III	30	硼酸 Boricacid*	10043-35-3 11113-50-1	233-139-2 234-343-4	N.D.	0.01%
III	31	②四硼酸鈉，無水 Disodiumtetraborate,anhydrous*****	1330-43-4 12179-04-3 1303-96-4	215-540-4	N.D.	0.01%
III	32	②四硼酸鈉，水合物 Tetraboron disodiumheptaoxide,hydrate*****	12267-73-1	235-541-3	N.D.	0.01%

檢測報告
Test Report

批次 Batch	序號 No.	物質名稱 Substance Name(s)	CAS 號 CAS No.	EC 號 EC No.	濃度 Concentration (%)	報告檢出限 Report Limit
III	33	鉻酸鈉 Sodium chromate*	7775-11-3	231-889-5	N.D.	0.01%
III	34	鉻酸鉀 Potassium chromate*	7789-00-6	232-140-5	N.D.	0.01%
III	35	重鉻酸銨 Ammonium dichromate*	7789-09-5	232-143-1	N.D.	0.01%
III	36	重鉻酸鉀Potassium dichromate*	7778-50-9	231-906-6	N.D.	0.01%
IV	37	硫酸鈷 Cobalt(Ⅱ) sulphate*	10124-43-3	233-334-2	N.D.	0.01%
IV	38	硝酸鈷 Cobalt(Ⅱ) dinitrate*	10141-05-6	233-402-1	N.D.	0.01%
IV	39	碳酸鈷 Cobalt(Ⅱ) carbonate*	513-79-1	208-169-4	N.D.	0.01%
IV	40	醋酸鈷 Cobalt(Ⅱ) diacetate*	71-48-7	200-755-8	N.D.	0.01%
IV	41	乙二醇單甲醚2-Methoxyethanol	109-86-4	203-713-7	N.D.	0.005%
IV	42	乙二醇單乙醚2-Ethoxyethanol	110-80-5	203-804-1	N.D.	0.005%
IV	43	三氧化鉻Chromium trioxide*	1333-82-0	215-607-8	N.D.	0.01%
IV	44	①從三氧化鉻產生的酸類以及它們的齊聚物：鉻酸、重鉻酸、鉻酸和重鉻酸的齊聚物Acids generated from chromium trioxide and their oligomers: Chromic acid, Dichromic acid, Oligomers of chromic acid and dichromic acid*	7738-94-5 13530-68-2	231-801-5 236-881-5	N.D.	0.01%
V	45	乙二醇乙醚乙酸酯 2-ethoxyethyl acetate	111-15-9	203-839-2	N.D.	0.01%
V	46	鉻酸鍶 Strontium chromate*	7789-06-2	232-142-6	N.D.	0.01%
V	47	①1,2-苯二酸-二(C7-11 支鏈與直鏈)烷基(醇)酯 1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters	68515-42-4	271-084-6	N.D.	0.01%
V	48	肼 Hydrazine	7803-57-8 302-01-2	206-114-9	N.D.	0.01%
V	49	N-甲基吡咯烷酮 1-methyl-2-pyrrolidone	872-50-4	212-828-1	N.D.	0.01%
V	50	1，2，3-三氯丙烷 1,2,3-trichloropropane	96-18-4	202-486-1	N.D.	0.01%

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V	51	①鄰苯二甲酸二C6-8支鏈烷基酯（C7富集） 1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich	71888-89-6	276-158-1	N.D.	0.01%
VI	52	鉻酸鉻 Dichromiumtris(chromate)*	24613-89-6	246-356-2	N.D.	0.01%
VI	53	氫氧化鉻酸鋅鉀 Potassium hydroxyoctaoxodizincatedichromate*	11103-86-9	234-329-8	N.D.	0.01%
VI	54	氫氧化鉻酸鋅 Pentazinc chromate octahydroxide*	49663-84-5	256-418-0	N.D.	0.01%
VI	55	②矽酸鋁耐火陶瓷纖維 Aluminosilicate Refractory Ceramic Fibres (RCF) **	-	-	N.D.	0.05%
VI	56	②氧化鋯矽酸鋁耐火陶瓷纖維 Zirconia Aluminosilicate Refractory Ceramic Fibres (Zr-RCF) **	-	-	N.D.	0.05%
VI	57	①甲醛苯胺共聚物 Formaldehyde, oligomeric reaction products with aniline (technical MDA)▲	25214-70-4	500-036-1	N.D.	0.01%
VI	58	鄰苯二甲酸二甲氧基乙酯 Bis(2-methoxyethyl) phthalate	117-82-8	204-212-6	N.D.	0.005%
VI	59	2-甲氧基苯胺(鄰甲氧基苯胺) 2-Methoxyaniline (o-Anisidine)	90-04-0	201-963-1	N.D.	0.005%
VI	60	4-(1,1,3,3-四甲基丁基)苯酚 (別名：對特辛基苯酚) 4-(1,1,3,3-tetramethylbutyl) phenol (4-tert-Octylphenol)	140-66-9	205-426-2	N.D.	0.005%
VI	61	1,2-二氯乙烷 1,2-Dichloroethane	107-06-2	203-458-1	N.D.	0.005%

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VI	62	雙(2-甲氧基乙基)醚 (別名：二乙二醇二甲醚) Bis(2-methoxyethyl) ether	111-96-6	203-924-4	N.D.	0.005%
VI	63	砷酸 Arsenic acid*	7778-39-4	231-901-9	N.D.	0.01%
VI	64	砷酸鈣 Calcium arsenate*	7778-44-1	231-904-5	N.D.	0.01%
VI	65	砷酸鉛 Trileaddiarsenate*	3687-31-8	222-979-5	N.D.	0.01%
VI	66	N,N-二甲基乙醯胺 N,N-dimethylacetamide (DMAC)	127-19-5	204-826-4	N.D.	0.005%
VI	67	4,4'-亞甲基雙(2-氯苯胺) 2,2'-dichloro-4,4'-methylenedianiline (MOCA)	101-14-4	202-918-9	N.D.	0.005%
VI	68	酚酞 Phenolphthalein	77-09-8	201-004-7	N.D.	0.005%
VI	69	疊氮化鉛 Lead diazide*	13424-46-9	236-542-1	N.D.	0.01%
VI	70	2,4,6-三硝基間苯二酚鉛 (別名：收斂酸鉛) Lead 2,4,6-trinitro-m-phenylene dioxide (Lead styphnate)*	15245-44-0	239-290-0	N.D.	0.01%
VI	71	苦味酸鉛 Lead dipicrate*	6477-64-1	229-335-2	N.D.	0.01%
VII	72	1,2-二(2-甲氧基乙氧基)乙烷 1,2-bis(2-methoxyethoxy) ethane (TEGDME; triglyme)	112-49-2	203-977-3	N.D.	0.01%
VII	73	乙二醇二甲醚 1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME)	110-71-4	203-794-9	N.D.	0.01%
VII	74	三氧化二硼 Diboron trioxide*	1303-86-2	215-125-8	N.D.	0.01%
VII	75	甲醯胺 Formamide	75-12-7	200-842-0	N.D.	0.01%
VII	76	甲基磺酸鉛 Lead(II) bismethanesulfonate*	17570-76-2	401-750-5	N.D.	0.01%
VII	77	異氰尿酸三縮水甘油脂 TGIC(1,3,5-tris(oxiranylmethyl)-1,3,5-triazine-2,4,6(1H,3H,5H)-trione)	2451-62-9	219-514-3	N.D.	0.01%

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VII	78	異氰脲酸 β-三縮水甘油酯 β-TGIC (1,3,5-tris[(2S and 2R)-2,3-epoxypropyl]-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione)	59653-74-6	423-400-0	N.D.	0.01%
VII	79	4,4'-二(N,N-二甲氨基)二苯甲酮(米氏酮) 4,4'-bis(dimethylamino) benzophenone (Michler's ketone)	90-94-8	202-027-5	N.D.	0.01%
VII	80	4,4'-(對二甲氨基)二苯基甲烷(米氏堿) N,N,N',N'-tetramethyl-4,4'-methylenedianiline (Michler's base)	101-61-1	202-959-2	N.D.	0.01%
VII	81	C.I.鹼性紫 3[4-[4,4'-bis(dimethylamino) benzhydrylidene]cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride(C.I. Basic Violet 3)***	548-62-9	208-953-6	N.D.	0.01%
VII	82	C.I.鹼性藍 26 [4-[[4-anilino-1-naphthyl] [4-(dimethylamino)phenyl] methylene]cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride(C.I. Basic Blue 26)***	2580-56-5	219-943-6	N.D.	0.01%
VII	83	C.I.溶劑藍 4α,α-Bis[4-(dimethylamino) phenyl]-4(phenylamino) naphthalene-1-methanol (C.I. Solvent Blue 4)***	6786-83-0	229-851-8	N.D.	0.01%
VII	84	α,α-二[(二甲氨基)苯基]-4-甲氨基苯甲醇 4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol	561-41-1	209-218-2	N.D.	0.01%

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VIII	85	十溴二苯醚 Bis(pentabromophenyl) ether (decabromodiphenyl ether; DecaBDE)	1163-19-5	214-604-9	N.D.	0.05%
VIII	86	①4-壬基酚，分支或線性的壬基酚，包括含有 9 個碳烷基鏈的所有獨立的同分異構體和所有含有線性或分支 9 個碳烷基鏈的 UVCB 物質 4-Nonylphenol, branched and linear *[substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof]*	-	-	N.D.	0.05%
VIII	87	偶氮二甲醯胺 Diazene-1,2-dicarboxamide (C,C'-azodi(formamide))	123-77-3	204-650-8	N.D.	0.05%
VIII	88	對特辛基苯酚乙氧基醚 4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated*[covering well-defined substances and UVCB substances, polymers and homologues]*	-	-	N.D.	0.05%
VIII	89	全氟十一烷酸 Henicosafluoroundecanoic acid	2058-94-8	218-165-4	N.D.	0.05%
VIII	90	全氟十三酸 Pentacosafluorotridecanoic acid	72629-94-8	276-745-2	N.D.	0.05%

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VIII	91	六氫鄰苯二甲酸酐, 順式-六氫鄰苯二甲酸酐, 反式-六氫鄰苯二甲酸酐 Cyclohexane-1,2-dicarboxylic anhydride, cis-cyclohexane-1,2-dicarboxylic anhydride, trans-cyclohexane-1,2-dicarboxylic anhydride	85-42-7 13149-00-3 14166-21-3	201-604-9 236-086-3 238-009-9	N.D.	0.05%
VIII	92	甲基六氫苯酐, 4-甲基六氫苯酐, 1-甲基六氫化鄰苯二甲酸酐, 3-甲基六氫苯二甲酯酐 Hexahydromethylphthalic anhydride, Hexahydro-4-methylphthalic anhydride, Hexahydro-1-methylphthalic anhydride, Hexahydro-3-methylphthalic anhydride	25550-51-0 19438-60-9 48122-14-1 57110-29-9	247-094-1 243-072-0 256-356-4 260-566-1	N.D.	0.05%
VIII	93	全氟十四酸 Heptacosafluorotetradecanoic acid	376-06-7	206-803-4	N.D.	0.05%
VIII	94	鄰苯二甲酸二異戊酯 Diisopentylphthalate(DIPP)	605-50-5	210-088-4	N.D.	0.05%
VIII	95	①支鏈和直鏈 1,2-苯二羧二戊酯 1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	84777-06-0	284-032-2	N.D.	0.05%
VIII	96	鄰苯二甲酸正戊基異戊基酯 N-pentyl-isopentylphthalate	776297-69-9	--	N.D.	0.05%
VIII	97	甲氧基乙酸 Methoxyacetic acid	625-45-6	210-894-6	N.D.	0.05%
VIII	98	全氟十二烷酸 Tricosafluorododecanoic acid	307-55-1	206-203-2	N.D.	0.05%

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VIII	99	乙二醇二乙醚 1,2-Diethoxyethane	629-14-1	211-076-1	N.D.	0.05%
VIII	100	3-乙基-2-甲基-2-(3-甲基丁基)噁唑烷 3-ethyl-2-methyl-2-(3-methylbutyl)-1, 3-oxazolidine	143860-04-2	421-150-7	N.D.	0.05%
VIII	101	2,4-二氨基甲苯 4-methyl-m-phenylenediamine (toluene-2,4-diamine)	95-80-7	202-453-1	N.D.	0.05%
VIII	102	N-甲基乙醯胺 N-methylacetamide	79-16-3	201-182-6	N.D.	0.05%
VIII	103	氧化鉛與硫酸鉛的複合物 Pentaleadtetraoxidesulphate*	12065-90-6	235-067-7	N.D.	0.01%
VIII	104	4-氨基聯苯 Biphenyl-4-ylamine	92-67-1	202-177-1	N.D.	0.05%
VIII	105	地樂酚 Dinoseb (6-sec-butyl-2,4-dinitrophenol)	88-85-7	201-861-7	N.D.	0.05%
VIII	106	雙(十八酸基)二氧代三鉛 Dioxobis(stearato)trilead*	12578-12-0	235-702-8	N.D.	0.01%
VIII	107	硝酸鉛 Lead dinitrate*	10099-74-8	233-245-9	N.D.	0.01%
VIII	108	三堿式硫酸鉛 Tetralead trioxide sulphate*	12202-17-4	235-380-9	N.D.	0.01%
VIII	109	氧化鉛 Lead monoxide (lead oxide)*	1317-36-8	215-267-0	N.D.	0.01%
VIII	110	鈦酸鉛 Lead titanium trioxide*	12060-00-3	235-038-9	N.D.	0.01%
VIII	111	4,4'-二氨基-3,3'-二甲基二苯甲烷 4,4'-methylenedi-o-toluidine	838-88-0	212-658-8	N.D.	0.05%
VIII	112	堿式乙酸鉛 Acetic acid, lead salt, basic*	51404-69-4	257-175-3	N.D.	0.01%
VIII	113	硫酸二甲酯 Dimethyl sulphate	77-78-1	201-058-1	N.D.	0.05%
VIII	114	呋喃 Furan	110-00-9	203-727-3	N.D.	0.05%
VIII	115	顏料黃 41 Pyrochlore, antimony lead yellow*	8012-00-8	232-382-1	N.D.	0.01%

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VIII	116	四乙基鉛 Tetraethyllead*	78-00-2	201-075-4	N.D.	0.01%
VIII	117	二鹽基鄰苯二甲酸鉛 [Phthalato(2-)]dioxotrilead*	69011-06-9	273-688-5	N.D.	0.01%
VIII	118	硫酸二乙酯 Diethyl sulphate	64-67-5	200-589-6	N.D.	0.05%
VIII	119	氨基氰鉛鹽 Lead cyanamidate*	20837-86-9	244-073-9	N.D.	0.01%
VIII	120	摻雜鉛的矽酸鋇 Silicic acid ($H_2Si_2O_5$), barium salt (1:1), lead-doped*	68784-75-8	272-271-5	N.D.	0.01%
VIII	121	磷酸氧化鉛 Trilead dioxide phosphonate*	12141-20-7	235-252-2	N.D.	0.01%
VIII	122	鄰甲基苯胺 *o*-Toluidine	95-53-4	202-429-0	N.D.	0.05%
VIII	123	鄰氨基偶氮甲苯 *o*-aminoazotoluene	97-56-3	202-591-2	N.D.	0.05%
VIII	124	4-對氨基偶氮苯 4-aminoazobenzene	60-09-3	200-453-6	N.D.	0.05%
VIII	125	6-甲氧基-間甲苯胺 6-methoxy-*m*-toluidine (*p*-cresidine)	120-71-8	204-419-1	N.D.	0.05%
VIII	126	二丁基二氯化錫 Dibutyltin dichloride (DBTC)*	683-18-1	211-670-0	N.D.	0.05%
VIII	127	鈦酸鉛鋯 Lead titanium zirconium oxide*	12626-81-2	235-727-4	N.D.	0.01%
VIII	128	環氧丙烷 Methyloxirane (Propylene oxide)	75-56-9	200-879-2	N.D.	0.05%
VIII	129	1-溴代正丙烷 1-bromopropane (n-propyl bromide)	106-94-5	203-445-0	N.D.	0.05%
VIII	130	堿式碳酸鉛 Trileadbis(carbonate)dihydroxide *	1319-46-6	215-290-6	N.D.	0.01%
VIII	131	C16-18-脂肪酸鉛鹽 Fatty acids, C16-18, lead salts*	91031-62-8	292-966-7	N.D.	0.01%
VIII	132	四氧化三鉛 Orange lead (lead tetroxide)*	1314-41-6	215-235-6	N.D.	0.01%

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VIII	133	二堿式亞硫酸鉛(II) Sulfurous acid, lead salt, dibasic*	62229-08-7	263-467-1	N.D.	0.01%
VIII	134	4,4'-二氨基二苯醚 4,4'-oxydianiline and its salts	101-80-4	202-977-0	N.D.	0.05%
VIII	135	堿式硫酸鉛 Lead oxide sulfate*	12036-76-9	234-853-7	N.D.	0.01%
VIII	136	四氟硼酸鉛 Lead bis(tetrafluoroborate)*	13814-96-5	237-486-0	N.D.	0.01%
VIII	137	矽酸鉛 Silicic acid, lead salt*	11120-22-2	234-363-3	N.D.	0.01%
VIII	138	N,N-二甲基甲醯胺 N,N-dimethylformamide	68-12-2	200-679-5	N.D.	0.05%
IX	139	鎘 Cadmium	7440-43-9	231-152-8	N.D.	0.01%
IX	140	氧化鎘 Cadmium oxide*	1306-19-0	215-146-2	N.D.	0.01%
IX	141	鄰苯二甲酸二戊酯 Dipentyl phthalate (DPP)	131-18-0	205-017-9	N.D.	0.01%
IX	142	①乙氧基化的支鏈和直鏈的 4-壬基酚（直鏈和/或支鏈的具有 9 個碳原子的烷基鏈共價鍵合在4位的乙氧基酚，囊括了 UVCB 和定義明確的物質，聚合物及同系物，其中包括任何單獨的異構體和/或它們的組合） 4-Nonylphenol, branched and linear,ethoxylated *[substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, ethoxylated covering UVCB- and well-defined substances, polymers and homologues, which include any of the individual isomers and/or combinations thereof]*	-	-	N.D.	0.05%
IX	143	全氟辛酸銨 Ammonium pentadecafluorooctanoate (APFO)	3825-26-1	223-320-4	N.D.	0.01%
IX	144	全氟辛烷酸 Pentadecafluorooctanoic acid (PFOA)	335-67-1	206-397-9	N.D.	0.01%

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X	145	①磷酸三(二甲苯)酯 Trixylyl phosphate	25155-23-1	246-677-8	N.D.	0.01%
X	146	C.I.直接黑 38 Disodium 4-amino-3-[[4'-[(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo]-5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate (C.I. Direct Black 38)***	1937-37-7	217-710-3	N.D.	0.01%
X	147	鄰苯二甲酸二己酯 Dihexyl phthalate	84-75-3	201-559-5	N.D.	0.01%
X	148	硫化鎘 Cadmium sulphide*	1306-23-6	215-147-8	N.D.	0.01%
X	149	C.I.直接紅 28 Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate) (C.I. Direct Red 28)***	573-58-0	209-358-4	N.D.	0.01%
X	150	醋酸鉛(Ⅱ)Lead di(acetate)*	301-04-2	206-104-4	N.D.	0.01%
X	151	1,2-亞乙基硫脲 Imidazolidine-2-thione; 2-imidazoline-2-thiol	96-45-7	202-506-9	N.D.	0.01%
XI	152	①鄰苯二甲酸二己酯,直鏈和支鏈 1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	68515-50-4	271-093-5	N.D.	0.01%
XI	153	氯化鎘 Cadmium chloride *	10108-64-2	233-296-7	N.D.	0.01%
XI	154	②過硼酸鈉，水合物; 過硼酸鈉鹽 Sodium perborate; perboric acid, sodium salt *****	15120-21-5 11138-47-9	239-172-9 234-390-0	N.D.	0.01%
XI	155	②過硼酸鈉，無水 Sodium peroxometaborate *****	7632-04-4	231-556-4	N.D.	0.01%

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XII	156	2-(2H-苯並三唑-2-基)-4,6-二叔戊基苯酚 2-(2H-Benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	25973-55-1	247-384-8	N.D.	0.01%
XII	157	2-(2'-羥基-3',5'-二叔丁基苯基)-苯並三唑 2-Benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)	3846-71-7	223-346-6	N.D.	0.01%
XII	158	二正辛基-雙(巯乙酸2-乙基己酯)錫2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)*	15571-58-1	239-622-4	N.D.	0.05%
XII	159	氟化鎘Cadmium fluoride*	7790-79-6	232-222-0	N.D.	0.01%
XII	160	硫酸鎘 Cadmium sulphate*	10124-36-4 31119-53-6	233-331-6	N.D.	0.01%
XII	161	①二正辛基-雙(巯乙酸2-乙基己酯)錫(DOTE)和三(2-乙基己基巯基乙酸)辛錫(MOTE)的反應物料Reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE)*	-	-	N.D.	0.05%

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批次 Batch	序號 No.	物質名稱 Substance Name(s)	CAS 號 CAS No.	EC 號 EC No.	濃度 Concentration (%)	報告檢出限 Report Limit
XIII	162	①1,2-苯二羧酸, 二-C6-10-烷基酯；（葵基，己基，辛基）酯與1,2-苯二甲酸的複合物，其鄰苯二甲酸二己酯含量≥0.3% (EC No. 201-559-5)1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2- benzenedicarboxylic acid, mixed decyl and hexyl and octyldiesters with ≥ 0.3% of dihexyl phthalate (EC No. 201-559-5)	68515-51-5 68648-93-1	271-094-0 272-013-1	N.D.	0.05%
XIII	163	①5-仲丁基-2-(2,4-二甲基環己-3-烯-1-基)-5-甲基-1,3-二惡烷[1]，5-二級丁基-2-(4,6-二甲基環己-3-烯-1-基)-5-甲基-1,3-二惡烷[2] [任何[1]和[2]或者其任意組合的單獨異構體或其任何組合]（卡拉花醛及其異構體以及它們的混合物） 5-sec-butyl-2-(2,4-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [1], 5-sec-butyl-2-(4,6-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [2] [covering any of the individual stereoisomers of [1] and [2] or any combination thereof]	-	-	N.D.	0.05%
XIV	164	硝基苯 Nitrobenzene	98-95-3	202-716-0	N.D.	0.01%
XIV	165	2,4-二-叔丁基-6-(5-氯-2H-苯並三唑-2-基)苯酚 2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327)	3864-99-1	223-383-8	N.D.	0.01%

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批次 Batch	序號 No.	物質名稱 Substance Name(s)	CAS 號 CAS No.	EC 號 EC No.	濃度 Concentration (%)	報告檢出限 Report Limit
XIV	166	2-(2'-羥基-3'-異丁基-5'-叔丁基苯基)苯並三唑 2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl) phenol (UV-350)	36437-37-3	253-037-1	N.D.	0.01%
XIV	167	1,3-丙烷磺內酯 1,3-propanesultone	1120-71-4	214-317-9	N.D.	0.01%
XIV	168	全氟壬酸及其鈉和銨鹽 Perfluorononan-1-oic-acid and its sodium and ammonium salts	375-95-1 21049-39-8 4149-60-4	206-801-3	N.D.	0.01%
XV	169	苯並(a)芘 Benzo[def]chrysene (Benzo[a]pyrene)	50-32-8	200-028-5	N.D.	0.01%
XVI	170	雙酚 A(BPA) 4,4'-isopropylidenediphenol (bisphenol A; BPA)	80-05-7	201-245-8	N.D.	0.01%
XVI	171	全氟癸酸(PFDA)及其鈉鹽和銨鹽 Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts	3108-42-7 335-76-2 3830-45-3	221-470-5 206-400-3 -	N.D.	0.01%
XVI	172	4-(1,1-二甲基丙基)苯酚 (別名：對叔戊基苯酚) *p*-(1,1-dimethylpropyl)phenol	80-46-6	201-280-9	N.D.	0.01%

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批次 Batch	序號 No.	物質名稱 Substance Name(s)	CAS 號 CAS No.	EC 號 EC No.	濃度 Concentration (%)	報告檢出限 Report Limit
XVI	173	①支鏈與直鏈的 4-庚基酚(直鏈和/或支鏈的具有 7 個碳原子的烷基鏈共價鍵在 4 位的苯酚，囊括了 UVCB 和定義明確的物質，其中包括任何單獨異構體和/或它們的組合)4-heptylphenol, branched and linear [substances with a linear and/or branched alkyl chain with a carbon number of 7 covalently bound predominantly in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof]	-	-	N.D.	0.05%
XVII	174	全氟己基磺酸及其鹽 Perfluorohexane-1-sulphonic acid and its salts	-	-	N.D.	0.0005%
XVIII	175	得克隆(包括其所有反式和順式異構體及其組合) Dechlorane plus (including any of its individual anti- and syn-isomers or any combination thereof)	-	-	N.D.	0.01%
XVIII	176	苯並[a]蒽Benzo[a]anthracene	56-55-3 1718-53-2	200-280-6	N.D.	0.01%
XVIII	177	硝酸鎘Cadmium nitrate*	10325-94-7 10022-68-1	233-710-6	N.D.	0.01%
XVIII	178	碳酸鎘Cadmium carbonate*	513-78-0	208-168-9	N.D.	0.01%
XVIII	179	氫氧化鎘Cadmium hydroxide*	21041-95-2	244-168-5	N.D.	0.01%
XVIII	180	䓛Chrysene	218-01-9 1719-03-5	205-923-4	N.D.	0.01%

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批次 Batch	序號 No.	物質名稱 Substance Name(s)	CAS 號 CAS No.	EC 號 EC No.	濃度 Concentration (%)	報告檢出限 Report Limit
XVIII	181	③1,3,4-噻二唑烷-2,5-二硫酮，甲醛和4-庚基苯酚的支鏈和直鏈(RP-HP)的反應產物[4-庚基苯酚，支鏈和直鏈含量≥0.1% w/w] Reaction products of 1,3,4-thiadiazolidine-2,5-dithione, formaldehyde and 4-heptylphenol, branched and linear (RP-HP)[with ≥0.1% w/w 4-heptylphenol, branched and linear (4-HPbl)]	-	-	N.D.	0.05%
XIX	182	八甲基環四矽氧烷 Octamethylcyclotetrasiloxane (D4)	556-67-2	209-136-7	N.D.	0.01%
XIX	183	十甲基環五矽氧烷 Decamethylcyclopentasiloxane (D5)	541-02-6	208-764-9	N.D.	0.01%
XIX	184	十二甲基環六矽氧烷 Dodecamethylcyclohexasiloxane(D6)	540-97-6	208-762-8	N.D.	0.01%
XIX	185	鉛 Lead	7439-92-1	231-100-4	N.D.	0.01%
XIX	186	八硼酸二鈉 Disodium octaborate*	12008-41-2	234-541-0	N.D.	0.01%
XIX	187	苯並(g,h,i)苝 Benzo[ghi]perylene	191-24-2	205-883-8	N.D.	0.01%
XIX	188	氫化三聯苯 Terphenyl, hydrogenated	61788-32-7	262-967-7	N.D.	0.01%
XIX	189	乙二胺 Ethylenediamine (EDA)	107-15-3	203-468-6	N.D.	0.01%
XIX	190	偏苯三酸酐 Benzene-1,2,4-tricarboxylic acid 1,2 anhydride (trimellitic anhydride) (TMA)	552-30-7	209-008-0	N.D.	0.01%
XIX	191	鄰苯二甲酸二環己酯 Dicyclohexyl phthalate (DCHP)	84-61-7	201-545-9	N.D.	0.01%

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批次 Batch	序號 No.	物質名稱 Substance Name(s)	CAS 號 CAS No.	EC 號 EC No.	濃度 Concentration (%)	報告檢出限 Report Limit
XX	192	4,4'-(1,3-二甲基丁基)二苯酚 2,2-bis(4'-hydroxyphenyl)-4-methylpentane	6807-17-6	401-720-1	N.D.	0.01%
XX	193	苯並[k]熒蒽 Benzo[k]fluoranthene	207-08-9	205-916-6	N.D.	0.01%
XX	194	熒蒽 Fluoranthene	206-44-0	205-912-4	N.D.	0.01%
XX	195	菲 Phenanthrene	85-01-8	201-581-5	N.D.	0.01%
XX	196	芘 Pyrene	129-00-0	204-927-3	N.D.	0.01%
XX	197	1,7,7-三甲基-3-(苯亞甲基)雙環[2,2,1]庚-2-酮 1,7,7-trimethyl-3-(phenylmethylene) bicyclo[2.2.1]heptan-2-one	15087-24-8	239-139-9	N.D.	0.01%

檢測依據 Test Method:

參考 US EPA3052:1996, US EPA 3050B:1996, US EPA3060A:1996, US EPA 3550C:2007, US EPA 3540C:1996, ISO 17353:2004(E), EN 14582:2016 進行樣品預處理。

Refer to US EPA3052:1996, US EPA 3050B:1996, US EPA3060A:1996, US EPA 3550C:2007, US EPA 3540C:1996, ISO 17353:2004(E), EN 14582:2016 for sample pretreatment.

采用 ICP-OES, UV-Vis, IC, HPLC, GC-MS, GC-MS(NCI),GC-FID,Headspace-GCMS 及 LC-MS-MS 分析。

Analyzed by ICP-OES, UV-Vis, IC, HPLC, GC-MS, GC-MS(NCI), GC-FID,Headspace-GCMS and LC-MS-MS.

測試樣品/部位描述 黑色熱縮管(不含油墨)

Tested Sample/Part Description Black heat shrink able tube(Excluding the white printed)

注釋 Note:

1. w/w % = 重量百分比 weight by weight; 0.1%=1000mg/kg =1000ppm
2. N.D. = 未檢出 Not Detected (小於報告檢出限<report limit)
3. *:該物質的濃度值是由物質中的特徵元素測試結果換算而來。Concentration value of the substance bythe conversion fromthe test results of certain elements.
   三丁基氧化錫(TBTO)、二丁基二氯化錫(DBTC)、二正辛基-雙(巯乙酸 2-乙基己酯)錫(DOTE)、二正辛基-雙(巯乙酸 2-乙基己酯)錫(DOTE)和三(2-乙基己基巯基乙酸)辛錫(MOTE)的反應物料的濃度值是由其特定化合物(三丁基錫(TBT)、二丁基錫(DBT)、二辛基錫(DOT)、單辛基錫(MOT))的結果換算而來。Concentration value of Bis(tributyltin)oxide(TBTO), Dibutyltin dichloride (DBTC), 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE), Reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8- oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate(reaction mass of DOTEand MOTE)by theconversion from the test results of certain compounds(Tributyl Tins(TBT), Dibutyl Tins(DBT), Dioctyl Tins(DOT), Monooctyl Tins(MOT)).
4. **:在化學物質及其混合物的分類，標記與包裝法規，即 CLP 法規(法規(EC)No 1272/2008)的附錄 VI 中，索引號 650-017-00-8 適用於所有的耐火陶瓷纖維材料。All refractory ceramic fibres are coveredby index number 650-017-00-8 in Annex VI of theRegulation on Classification, Labeling and Packagingof chemical substances and mixtures, the so called CLP Regulation(Regulation (EC) No 1272/2008).
5. ***:C.I.:顏料索引號 Colour Index
6. ****:蒸餾所分離出來的輕油部分 Light fractions from distillation
7. *****:四硼酸鈉，無水和四硼酸鈉，水合物的濃度均由四硼酸鈉濃度表示，沒有考慮結晶水。過硼酸鈉，水合物；過硼酸鈉鹽和過硼酸鈉，無水的濃度均由過硼酸鈉濃度表示，沒有考慮結晶水。Concentration value of Disodiumtetraborate,anhydrous and Tetraboron disodiumheptaoxide,hydrate is evaluated by Disodiumtetraborate, with no consider of the hydrate. Concentration value of Sodium perborate; perboric acid, sodium salt; Sodium peroxometaborate is evaluated by Sodium perborate, with no consider of the hydrate.
8. ▲:甲醛苯胺共聚物的濃度值是由其特定化合物(2,4-二氨基二苯甲烷、4,4'-二氨基二苯基甲烷、2,6-二氨基二苯甲烷)的結果換算而來。Concentration value ofFormaldehyde, oligomeric reaction productswith aniline(technical MDA)by the conversion from the test results ofcertain compounds (2,4-Diaminodiphenylmethane,4,4'- Diaminodiphenylmethane, 2,6-Diaminodiphenylmethane).
9. ①:由於這些物質是 UVCB 物質(未知成分或可變成分的，複雜反應物或生物材料的物質)，由各種不同的成分組成，所以這些物質的測試結果是由選定的具有代表性的物質的主要組成成分的測試結果換算而來的。In view of the substances are established as UVCBsubstances(substancesof unknown orvariable composition, complex reaction products or biological materials) consisting ofdifferent and variable constituents, the test resultsare calculated based on the main constituents of therepresentative compounds for substances.

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10. ②:由於此物質含有多種物質，測試結果是基於此物質中最具有代表性的主要組成化合物的含量，其主要組成化合物的測試結果是基於特徵元素的濃度換算而來。In view of the substance containvariable substances, the test resultsare calculated based onmain constituents of the representativecompounds for the substances,and the test results of the representative compounds are calculated basedon the result of specified heavy metal elements.
11. ③:該物質是 UVCB 物質(未知成分或可變成分的，複雜反應物或生物材料的物質)，由各種不同的成分組成，其測試結果以 4-庚基苯酚，支鏈和直鏈測試結果體現，當 4-庚基苯酚，支鏈和直鏈含量≥0.1% w/w 時，對於該物質是否存在於樣品中需核查相應物料的 MSDS 或向供應商進行確認。
The substance is established as UVCB substance(substances of unknown or variable composition, complex reaction products or biological materials) consisting of different and variable constituents, the test result is calculated based on 4-heptylphenol, branched and linear. When the content of 4-heptylphenol, branched and linear is equal to or higher than 0.1% (w/w), the presence of the substance in the sample need to be further confirmed by checking MSDS or requesting from suppliers.

附加信息 Appendix:

1. 根據歐盟 REACH 法規（編號 1907/2006）第 33 條款之規定，物品類產品如果含有候選清單上的高度關注物質且在物品中的质量百分比超過 0.1%時，物品供應方需履行相關信息傳遞義務:
   Any supplier of an article containing a substance that is included in the Candidate List in a concentration above 0.1 % weight by weight (w/w) has the duty to communicate information in accordance with Article 33 of European Union regulation concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).
   1) 物品供應方應提供給接收方關於產品的足夠信息以確保物品的安全使用，至少需提供所含高度關注物質的名稱。Any supplier shall provide the recipient of the article with sufficient information to allowsafe use of the article including, as a minimum, the name of that substance.
   2) 應消費者請求，物品供應方應在 45 天內免費提供關於產品的足夠信息以確保物品的安全使用，至少需提供所含高度關注物質的名稱。On request by a consumer any supplier shall provide the consumer with sufficient information to allow safe use of the article including, as a minimum, the name of that substance within 45 days of receipt of the request, free of charge.
2. 根據歐盟 REACH 法規（編號 1907/2006）第 31 條款及附件 2 之規定，提供高度關注物質的物質類產品供應方，應免費提供接收方該物質的安全數據表。The supplier of a substance that is included in the Candidate List on their own shall provide the recipient of the substance with a safety data sheet for free compiled in accordance with Article 3 and Annex II of REACH.
3. 根據歐盟 REACH 法規（編號 1907/2006）第 31、32 條款及附件 2 之規定，提供含有高度關注物質的混合物產品供應方需傳遞相關信息:
   The supplier of a mixture that containing a substance that is included in the Candidate List shall exchange information in accordance with Article 31, Article 32, and Annex II of REACH.
   1) 如果混合物產品按照 1999/45/EC 被判定爲危險品時，供應方應免費提供產品的安全數據表。Any supplier shall provide the recipient of the mixture with a safety data sheet for free where a preparation meets the criteria for classification as dangerous in accordance with Directives 1999/45/EC.
   2) 如果混合物產品按照 1999/45/EC 判定並非危險品，但是任一高度關注物質在非氣體混合物中质量分數超過 0.1%或在氣體混合物中體積分數超過 0.2%，供應方也應免費提供產品的安全數據表。Any supplier shall provide the recipient of the mixture with a safety data sheet for free where a preparation does not meet the criteria for classification as dangerous in accordance with Directive 1999/45/EC, but contains any substance that is included in the Candidate List in an individual concentration of ≥ 0.1 % by weight for non-gaseous mixtures or ≥ 0.2 % by volume for gaseous mixtures.

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檢測流程 Test Process

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樣品圖片

Photo(s) of the sample(s)

*** 報告結束 ***

*** End of Report ***

聲明 Statement：

1.檢測報告無批准人簽字、“專用章”及報告騎縫章無效；

This report is considered invalid without approved signature, special seal and the seal on the perforation;

2.樣品及樣品信息由申請者提供，申請者應對其真實性負責，CTI 未核實其真實性；

The sample(s) and sample information was/were provided by the client who should be responsible for the authenticity which CTI hasn’t verified;

3.本報告檢測結果僅對受測樣品負責；

The result(s) shown in this report refer(s) only to the sample(s) tested;

4.未經 CTI 書面同意，不得部分複製本報告；

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In case of any discrepancy between the English version and Chinese version of the testing reports (if generated), the Chinese version shall prevail.

檢測報告
Test Report

報告編號 A2190023615188001E
Report No. A2190023615188001E

申請單位 漢保實業股份有限公司
Applicant HAMBURG INDUSTRIES CO.,LTD.
地 址 222 新北市深坑區北深路三段 270 巷 12 號 6 樓
Address 6F., NO.12, LANE 270, SEC.3, PEISHEN RD., SHEN KENG DISTRICT, NEW TAIPEI CITY, TAIWAN 222

以下測試之樣品及樣品信息由申請者提供並確認
The following sample(s) and sample information was/were submitted and identified by/on the behalf of the client

樣品名稱 Sample Name	環保阻燃熱收縮套管(無鹵)Heat Shrinkable Polyolefin Tubing (Halogen Free)
客戶參考信息 Client Reference Information	HAMBURG-A H-2& H-2(CB)
樣品批號 Item No.	19011006884
材料名稱 Material	Polyolefin
樣品接收日期 Sample Received Date	2019.03.21 Mar. 21, 2019
樣品檢測日期 Testing Period	2019.03.21-2019.03.29 Mar. 21, 2019 to Mar. 29, 2019

檢測要求/檢測依據/檢測結果
Test Requested /Test Method/Test Result(s)

請參見下頁。
Please refer to the following page(s).

主 檢 Tested by 李正苏
審 核 Reviewed by 陶英
批 准 Approved by 陳凱敏 實驗室經理 Lab Manager
日 期 Date 2019.03.29

No. T172791639

上海華測品標檢測技術有限公司
Centre Testing International Pinbiao(Shanghai) Co., Ltd.
上海市浦東新區新金橋路 1996 號
No. 1996, Xinjinqiao Road, Pudong New District, Shanghai,China

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檢測要求	根據客戶要求，對所提交樣品中的鉛(Pb)，鎘(Cd)，汞(Hg)，六價鉻(Cr(VI))，多溴聯苯(PBBs)，多溴二苯醚(PBDEs),六溴環十二烷(HBCDD)，氟(F)，氯(Cl)，溴(Br)，碘(I)，全氟辛烷磺酸(PFOS)，全氟辛烷酸(PFOA)，四溴雙酚 A (TBBP-A)，鄰苯二甲酸酯,三氧化二銻(Sb_2O_3)進行測試。
Test Requested	As specified by client, to test Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyls(PBBs), Polybrominated Diphenyl Ethers (PBDEs), Hexabromocyclododecane (HBCDD), Fluorine (F), Chlorine (Cl), Bromine (Br), Iodine (I), Perfluorooctane Sulfonates (PFOS), Perfluorooctanoic Acid (PFOA), Tetrabromobisphenol A (TBBP-A), Phthalates,Antimony trioxide (Sb_2O_3) in the submitted sample(s).

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檢測依據 Test Method

測試項目 Tested Item(s)	測試方法 Test Method	測試儀器 Measured Equipment(s)
鉛(Pb) Lead (Pb), 鎘(Cd) Cadmium (Cd), 汞(Hg) Mercury (Hg), 六價鉻(Cr(VI)) Hexavalent Chromium (Cr(VI))	IEC 62321-5:2013, IEC 62321-4:2013+AMD1:2017 CSV, IEC 62321-7-2:2017	ICP-OES, UV-Vis
多溴聯苯(PBBs) Polybrominated Biphenyls (PBBs), 多溴二苯醚(PBDEs) Polybrominated Diphenyl Ethers (PBDEs)	IEC 62321-6:2015	GC-MS
鄰苯二甲酸酯 Phthalates	IEC 62321-8:2017	GC-MS
六溴環十二烷 Hexabromocyclododecane (HBCDD)	IEC 62321-6:2015	GC-MS
氟 Fluorine (F)	參考 EN 14582:2016 Refer to EN 14582:2016	IC
氯 Chlorine (Cl)	參考 EN 14582:2016 Refer to EN 14582:2016	IC
溴 Bromine (Br)	參考 EN 14582:2016 Refer to EN 14582:2016	IC
碘 Iodine (I)	參考 EN 14582:2016 Refer to EN 14582:2016	IC
全氟辛烷磺酸 Perfluorooctane Sulfonates (PFOS)	參考 US EPA 3550C:2007 & US EPA 8321B:2007 Refer to US EPA 3550C:2007 & US EPA 8321B:2007	LC-MS-MS
全氟辛烷酸 Perfluorooctanoic Acid (PFOA)	參考 US EPA 3550C:2007 & US EPA 8321B:2007 Refer to US EPA 3550C:2007 & US EPA 8321B:2007	LC-MS-MS
四溴雙酚 A Tetrabromobisphenol A (TBBP-A)	參考 US EPA 3550C:2007 & US EPA 8321B:2007 Refer to US EPA 3550C:2007 & US EPA 8321B:2007	LC-MS-MS

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Test Report

測試項目 Tested Item(s)	測試方法 Test Method	測試儀器 Measured Equipment(s)
三氧化二銻 Antimony trioxide (Sb_2O_3)	參考 US EPA 3052:1996 & US EPA 6010D:2014 Refer to US EPA 3052:1996 & US EPA 6010D:2014	ICP-OES

檢測結果 Test Result(s)

測試項目 Tested Item(s)	**結果 Result**	**方法檢出限 MDL**
鉛 Lead (Pb)	N.D.	2 mg/kg
鎘 Cadmium (Cd)	N.D.	2 mg/kg
汞 Mercury (Hg)	N.D.	2 mg/kg
六價鉻 Hexavalent Chromium (Cr(VI))	N.D.	8 mg/kg

測試項目 Tested Item(s)	**結果 Result**	**方法檢出限 MDL**
多溴聯苯 Polybrominated Biphenyls(PBBs)		
一溴聯苯 Monobromobiphenyl	N.D.	5 mg/kg
二溴聯苯 Dibromobiphenyl	N.D.	5 mg/kg
三溴聯苯 Tribromobiphenyl	N.D.	5 mg/kg
四溴聯苯 Tetrabromobiphenyl	N.D.	5 mg/kg
五溴聯苯 Pentabromobiphenyl	N.D.	5 mg/kg
六溴聯苯 Hexabromobiphenyl	N.D.	5 mg/kg
七溴聯苯 Heptabromobiphenyl	N.D.	5 mg/kg
八溴聯苯 Octabromobiphenyl	N.D.	5 mg/kg
九溴聯苯 Nonabromobiphenyl	N.D.	5 mg/kg
十溴聯苯 Decabromobiphenyl	N.D.	5 mg/kg

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測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
多溴二苯醚 Polybrominated Diphenyl Ethers (PBDEs)		
一溴二苯醚 Monobromodiphenyl ether	N.D.	5 mg/kg
二溴二苯醚 Dibromodiphenyl ether	N.D.	5 mg/kg
三溴二苯醚 Tribromodiphenyl ether	N.D.	5 mg/kg
四溴二苯醚 Tetrabromodiphenyl ether	N.D.	5 mg/kg
五溴二苯醚 Pentabromodiphenyl ether	N.D.	5 mg/kg
六溴二苯醚 Hexabromodiphenyl ether	N.D.	5 mg/kg
七溴二苯醚 Heptabromodiphenyl ether	N.D.	5 mg/kg
八溴二苯醚 Octabromodiphenyl ether	N.D.	5 mg/kg
九溴二苯醚 Nonabromodiphenyl ether	N.D.	5 mg/kg
十溴二苯醚 Decabromodiphenyl ether	N.D.	5 mg/kg

測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
鄰苯二甲酸酯 Phthalates (DBP, BBP, DEHP, DIBP)		
鄰苯二甲酸二丁酯 Dibutyl phthalate (DBP) CAS#:84-74-2	N.D.	50 mg/kg
鄰苯二甲酸丁基苄基酯 Butyl benzyl phthalate (BBP) CAS#:85-68-7	N.D.	50 mg/kg
鄰苯二甲酸二(2-乙基)己酯 Di-(2-ethylhexyl) phthalate (DEHP) CAS#:117-81-7	N.D.	50 mg/kg
鄰苯二甲酸二異丁酯 Diisobutyl phthalate (DIBP) CAS#:84-69-5	N.D.	50 mg/kg

測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
六溴環十二烷 Hexabromocyclododecane (HBCDD)	N.D.	10 mg/kg

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測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
氟 Fluorine (F)	102 mg/kg	10 mg/kg
氯 Chlorine (Cl)	N.D.	10 mg/kg
溴 Bromine (Br)	N.D.	10 mg/kg
碘 Iodine (I)	N.D.	10 mg/kg

測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
全氟辛烷磺酸 Perfluorooctane Sulfonates (PFOS)	N.D.	5 mg/kg

測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
全氟辛烷酸 Perfluorooctanoic Acid (PFOA)	N.D.	5 mg/kg

測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
四溴雙酚 A Tetrabromobisphenol A (TBBP-A)	N.D.	5 mg/kg

測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
鄰苯二甲酸酯 Phthalates		
鄰苯二甲酸二己酯 Di-n-hexyl phthalate (DNHP) CAS#:84-75-3	N.D.	50 mg/kg
鄰苯二甲酸二正辛酯 Di-n-octyl phthalate (DNOP) CAS#:117-84-0	N.D.	50 mg/kg
鄰苯二甲酸二異壬酯 Di-isononyl phthalate (DINP) CAS#:28553-12-0,68515-48-0	N.D.	50 mg/kg
鄰苯二甲酸二異癸酯 Di-iso-decyl phthalate (DIDP) CAS#:26761-40-0,68515-49-1	N.D.	50 mg/kg

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測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
三氧化二銻 Antimony trioxide (Sb_2O_3)	N.D.*	10 mg/kg

測試樣品/部位描述 黑色熱縮管(不含油墨)
Tested Sample/Part Description Black heat shrink able tube(Excluding the white printed)

備註: **對於檢測鉛，鎘，汞之樣品已完全溶解。**
-N.D. = 未檢出 (小於方法檢出限)
-mg/kg = ppm = 百萬分之一
-* = 測試結果根據金屬銻的濃度換算得來。樣品中是否存在三氧化二銻還需要進一步確認。

Remark: **The sample(s) had been dissolved totally tested for Lead, Cadmium, Mercury.**
-MDL = Method Detection Limit
-N.D. = Not Detected (<MDL)
-mg/kg = ppm = parts per million
-* = The test result of Antimony trioxide is converted from Antimony concentration. The presence of Antimony trioxide in the sample needs further confirmation.

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檢測流程 Test Process

1. 鉛 Lead(Pb), 鎘 Cadmium(Cd), 鉻 Chromium(Cr)

2. 汞 Mercury(Hg)

檢測報告
Test Report

3. 六價鉻 Hexavalent Chromium(Cr(VI))

4. 多溴聯苯 Polybrominated Biphenyls(PBBs), 多溴二苯醚 Polybrominated Diphenyl Ethers (PBDEs)

5. 六溴環十二烷 Hexabromocyclododecane (HBCDD)

6. 氟 Fluorine (F), 氯 Chlorine (Cl), 溴 Bromine (Br), 碘 Iodine (I)

7. 全氟辛烷磺酸 Perfluorooctane Sulfonates (PFOS), 全氟辛烷酸 Perfluorooctanoic Acid (PFOA)

8. 四溴雙酚 A Tetrabromobisphenol A (TBBP-A)

9.鄰苯二甲酸酯 Phthalates

檢測報告
Test Report

10. 三氧化二銻 Antimony trioxide (Sb_2O_3)

檢測報告
Test Report

樣品圖片

Photo(s) of the sample(s)

*** 報告結束 ***

*** End of Report ***

聲明 Statement：

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The sample(s) and sample information was/were provided by the client who should be responsible for the authenticity which CTI hasn’t verified;

3.本報告檢測結果僅對受測樣品負責；

The result(s) shown in this report refer(s) only to the sample(s) tested;

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In case of any discrepancy between the English version and Chinese version of the testing reports (if generated), the Chinese version shall prevail.

9.

304不鏽鋼片
SGS報告書

瀛隆壓著有限公司

產品成品圖
(Finish of Product Drawing)

T=0.1 ± 0.02	P=7.0	IS=2.4 ± 0.2	WS=1.7 ± 0.2
W=2.5 ± 0.02			

規格/SPECIFICATION

產品編號(PARTS NO) A7047-0

材質(MATERIAL) 304 STAINLESS (亮面)

對插端子(SUITABLE TERMMINAL)

適用電線(APPLICABLE MIRES)AGE# 26-30

線皮直徑(INSULLTION OD)(MM)

包裝數量(STANTARD PACKING) 10000 PCS

表面處理(SURFACE TREATMENT)

DONGGUAN HONGYANG HARDWARE MATERIAL CO.,LTD.

ABAO INDUSTRIAL ZONE A BUILDING 1 FLOOR ZHUFULING SHIYE ROAD TANGXIA TOWN DONGGUAN CITY GUANGDONG

The following sample(s) was/were submitted and identified on behalf of the clients as : SUS304

SGS Job No. :	CP17-062731 - GZ
Date of Sample Received :	17 Nov 2017
Testing Period :	17 Nov 2017 - 22 Nov 2017
Test Requested :	Selected test(s) as requested by client.
Test Method :	Please refer to next page(s).
Test Results :	Please refer to next page(s).
Conclusion :	Based on the performed tests on submitted sample(s), the results of Cadmium, Lead, Mercury, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of
SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

Merry

Merry Lv
Approved Signatory

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	CAN17-231311.001	Silver-gray metal

Remarks :

(1) 1 mg/kg = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to IEC 62321-4:2013+A1:2017, IEC62321-5:2013, IEC 62321-7-1:2015 and IEC 62321-6:2015 analyzed by ICP-OES , UV-Vis and GC-MS .

Test Item(s)	Limit	Unit	MDL	*001*
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	ND
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))▾	-	μg/cm²	0.10	ND
Sum of PBBs	1,000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1,000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND

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Test Item(s)	Limit	Unit	MDL	*001*
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND

Notes :

(1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
IEC 62321 series is equivalent to EN 62321 series
http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101::::FSP_ORG_ID,FSP_LANG_ID:1258637,25

(2) ▼= a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 µg/cm2. The sample coating is considered to contain CrVI

b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 µg/cm2). The coating is considered a non-CrVI based coating

c. The result between 0.10 µg/cm2 and 0.13 µg/cm2 is considered to be inconclusive - unavoidable coating variations may influence the determination

Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.

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ATTACHMENTS

Pb/Cd/Hg/Cr^{6+}/PBBs/PBDEs Testing Flow Chart

1) Name of the person who made testing: Edith Zhang / Sunny Hu
2) Name of the person in charge of testing: Bella Wang / Qiong Liu
3) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} and PBBs/PBDEs test method excluded).

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Sample photo:

CAN17-231311.001

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10.

3M 9888T雙面貼紙
SGS報告書

Double Coated Tissue Tapes

9888T

Temporary Technical Data ***May, 2011***

Product Description:

Product 9888T double coated tissue tape features a tissue carrier for dimensional stability and improved handling with ease of die cutting and laminating.

Construction:

Product Number	**Adhesive[1]/ Color/ Tape Thickness**	**Carrier**	**Liner Color, Type, Print**	**Liner Caliper**
9888T	Translucent, 0.0059” (0.150mm)	Tissue translucent in color	White, PE[2] polycoated paper, 3M logo print in red color	0.0059” (0.150mm)

Note 1: Pressure Sensitive Acrylic Adhesive provides excellent initial tack and adhesion to a wide variety surface including many low surface energy plastics.

Note 2: PE (Polyethylene)

Feature

1. 9888T feature a medium-soft acrylic pressure sensitive adhesive system. The key characteristics of this adhesive include a combination of high initial adhesion and good shear and holding power to a wide variety of materials, including many plastics.
2. 9888T feature controlled adhesive flow into open cell foam and controlled caliper for bond to application surface.
3. For foam laminating, it provides excellent foam stability to reduce stretching and allows to more precise alignment during application.

Typical Physical Properties and Performance Characteristics

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Product Number	9888T
Adhesion to stainless steel ASTM D3330 –180 degree, 2 mil Al foil at 22°C, 50%RH	g/25.4m
15 minute RT	2940
72 Hour RT	3180
Adhesion to ABS ASTM D3330 –180 degree, 2 mil Al foil at 22°C, 50%RH	
15 minute RT	2210
72 Hour RT	2440
Adhesion to PC ASTM D3330 –180 degree, 2 mil Al foil at 22°C, 50%RH	
15 minute RT	2560
72 Hour RT	2670
Adhesion to PP ASTM D3330 –180 degree, 2 mil Al foil at 22°C, 50%RH	
20 minute RT	1900
72 Hour RT	2190

Shear strength ASTM D3654 modified 0.5 $inch^2$ sample size at 22°C	
1000 grams	10000 mins
Relative High temperature Operating Ranges	
Long Term (days, weeks)	80°C
Short Term (minutes, hours)	120°C
Shelf Life 12 months from date of receipt by customer when stored in original carton at 22 °C and 50% relative humidity	

Application Techniques:

Bond strength is dependent upon the amount of adhesive-to-surface contact developed. Firm application pressure helps develop better adhesive contact and improves bond strength.

To obtain optimum adhesion, the bonding surfaces must be clean, dry and well unified. Some typical surface cleaning solvents are isopropyl alcohol or heptane. Note: Carefully read and follow the manufacturer's precautions and directions for use when working with solvents.

Ideal tape application temperature range is 70° F to 100° F (21° C to 38° C). Initial tape application to surfaces at temperatures below 50° F (10° C) is not recommended because the adhesive becomes too firm to adhere readily. However, once properly applied, low temperature holding is generally satisfactory.

General Information

Tape 9888T has a tissue carrier, which can add dimensional stability to foams and other substrates. The carrier also provides easier handling during slitting and die-cutting.

Application Ideas

- 9888T tapes are specially formulated for many indoor high performance purpose mounting and joining applications, including bonding to Polyethylene, Polypropylene and many other Plastics, where moderate temperature and shear performance are required.
- 9888T tapes are formulated for more demanding indoor and moderate outdoor high performance mounting and joining application.
- Application ideas for these tapes include
    - Lens attachment for mobile phone
    - Wire and Cable Clips
    - Appliance, Case for display and Electronics Equipment Trim
    - Interior under sheet for car
    - Paper splicing
    - Foam, Gasket attachment in mobile phones and pagers.
    - Plastics Hooks, Racks and Dispensers
    - Sign, Nameplates and Plaques
    - Appliques

Important Notice

3M MAKES NO WARRANTES, EXPRESS OR IMPLED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's method of application. Please remember that many factors can affect the use and performance of a 3M product in a particular application. The materials to be bonded with the product, the surface preparation of those materials, the product selected for use, the conditions in which the product is used, and the time and environmental conditions in which the product is expected to perform are among the many factors that can affect the use and performance of a 3M product. Given the variety of factors that can affect the use and performance of a 3M product, some of which are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for the user's method of application.

Limitation of Remedies and Liability

If the 3M product is proved to be defective, THE EXCLUSIVE REMEDY, AT 3M'S OPTION, SHALL BE TO REFUND THE PURCHASE PRICE OF OR TO REPAIR OR REPLACE THE DEFECTIVE 3M PRODUCT. 3M shall not otherwise be liable for loss or damages, whether direct, indirect, special, incidental, or consequential, regardless of the legal theory asserted, including negligence, warranty, or strict liability.

Signature Not Verified
For Question Please
Contact with SGS
www.sgs.com.tw

測試報告
Test Report

號碼(No.) : CE/2019/11905　　日期(Date) : 2019/01/15　　頁數(Page): 1 of 9

台灣明尼蘇達礦業製造股份有限公司
3M TAIWAN LTD.
桃園市楊梅區中山南路800巷66號
NO. 66, LANE 800, CHUNG-SHAN S. RD., YANG-MEI DISTRICT, TAOYUAN CITY 326, TAIWAN (R. O. C.)

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/on behalf of the applicant as):

送樣廠商(Sample Submitted By)	:	台灣明尼蘇達礦業製造股份有限公司 (3M TAIWAN LTD.)
樣品名稱(Sample Description)	:	3M TISSUE TAPE
樣品型號(Style/Item No.)	:	9888T, 9810T, 9815, 1815, 9516, 9183, 9183T, 6408, 9080HL, 9080T, 9448HK
收件日期(Sample Receiving Date)	:	2019/01/09
測試期間(Testing Period)	:	2019/01/09 to 2019/01/15

==========

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

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測試結果(Test Results)

測試部位(PART NAME)No.1　:　透明雙面膠（不含離型紙）(TRANSPARENT TWIN ADHESIVE TAPE (EXCLUDING THE RELEASE PAPER))

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No.1
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321-5 (2013)，以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n.d.
鉛 / Lead (Pb)	mg/kg	參考IEC 62321-5 (2013)，以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n.d.
汞 / Mercury (Hg)	mg/kg	參考IEC 62321-4 (2013)，以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-4 (2013) and performed by ICP-AES.	2	n.d.
六價鉻 / Hexavalent Chromium Cr(VI)	mg/kg	參考IEC 62321-7-2 (2017)，以UV-VIS檢測. / With reference to IEC 62321-7-2 (2017) and performed by UV-VIS.	8	n.d.
鹵素 / Halogen				
鹵素（氟）/ Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	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.	50	n.d.
鹵素（氯）/ Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)	mg/kg		50	n.d.
鹵素（溴）/ Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg		50	n.d.
鹵素（碘）/ Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg		50	n.d.

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No. 1
多溴聯苯總和 / Sum of PBBs	mg/kg	參考IEC 62321-6 (2015)，以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-6 (2015) and performed by GC/MS.	-	n.d.
一溴聯苯 / Monobromobiphenyl	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.
多溴聯苯醚總和 / Sum of PBDEs	mg/kg		-	n.d.
一溴聯苯醚 / Monobromodiphenyl ether	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.

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No.1
鄰苯二甲酸二(2-乙基己基)酯 / DEHP (Di-(2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg	參考IEC 62321-8 (2017)，以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
鄰苯二甲酸丁苯甲酯 / BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg		50	n.d.
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg		50	n.d.
鄰苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg		50	n.d.
鄰苯二甲酸二異癸酯 / DIDP (Di-isodecyl phthalate) (CAS No.: 26761-40-0; 68515-49-1)	mg/kg		50	n.d.
鄰苯二甲酸二異壬酯 / DINP (Di-isononyl phthalate) (CAS No.: 28553-12-0; 68515-48-0)	mg/kg		50	n.d.
鄰苯二甲酸二正辛酯 / DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	mg/kg		50	n.d.

備註(Note)：

1. mg/kg = ppm；0.1wt% = 1000ppm
2. n.d. = Not Detected (未檢出)
3. MDL = Method Detection Limit (方法偵測極限值)
4. "-" = Not Regulated (無規格值)

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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)

- 測試人員：陳恩臻 / Technician : Rita Chen
- 測試負責人：張啟興 / Supervisor: Troy Chang

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多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBB/PBDE

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor: Troy Chang

初次測試程序 / First testing process
選擇性篩檢程序 / Optional screen process
確認程序 / Confirmation process

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

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor : Troy Chang

【測試方法/Test method: IEC 62321-8】

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

- 測試人員：陳恩臻 / Technician: Rita Chen
- 測試負責人：張啟興 / Supervisor: Troy Chang

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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.)

CE/2019/11905

** 報告結尾 (End of Report) **

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11.

PET裝盤
SGS報告書

遠東新世紀	安全資料表(SDS) 版別：Jan.2017 化學製品及化學產品：A-PET 膠片

01. 化學品與廠商資料 (Product and Company Identification)

化學品名稱：A-PET 膠片

製造者/供應者名稱：

遠東新世紀股份有限公司(原遠東紡織股份有限公司)

新竹縣新埔鎮文山里 3 鄰文山路亞東段 369 號

TEL：(03)6209000

FAX：(03)6209057

02. 危害辨識資料 (Hazard Identification)

化學品危害分類：屬於無危險材料

其他危害： 無

03. 成分辨識資料 (Composition, Information on Ingredients)

中英文名稱：PET 共聚合物 ；(PET copolymer)

同義名稱：聚對苯二甲酸乙二醇酯

化學文摘社登記號碼(CAS No.) ： 25038-59-9

危害成分：無

04. 急救措施 (First Aid Measures)

吸入：無

皮膚接觸：不會造成人類過敏或其他不良反應

眼睛接觸：用清水清洗

食入：無立即性的危害，但建議送醫處置

本產品無毒性，對人體不會造成任何不良反應

05. 滅火措施 (Fire Fighting Measures)

適用之滅火器：水霧、二氧化碳、泡沫、乾粉

燃燒所產生之產物或氣體：水、CO_2、若氧氣不足，則產生 CO

特殊滅火程序：無

消防人員之特殊防護設備：無需特殊設備

06. 洩漏處理方法 (Accidental Release Measures)

個人應注意事項：無洩漏問題

環境注意事項：無洩漏問題

清理方式：人工移除(如打掃)

07. 安全處置與儲存方法 (Handling and Storage)

處置：建議以ＰＰ布包裝

儲存：避免高溫高濕及陽光直射環境

08. 暴露預防措施 (Exposure Controls, Personal Protection)

工程控制：無

個人防護設備：

- 呼吸防護：無
- 手部防護：建議使用手套避免刮傷
- 眼睛防護：無
- 皮膚及身體防護：無

衛生措施：

建議使用手套避免刮傷。

09. 物理及化學性質 (Physical and Chemical Properties)

(1)絕對黏度(I V)	：＞0.65 使用 60/40 (w/w) 酚/ 1,1,2,2-四氯乙烷溶劑於 30℃使用 Ubbelohde 黏度計量測
(2)熔點	：250 ± 5 ℃，依據 DSC 熱分析儀量測
(3)軟化點	：65~72℃
(4)密度	：1.30~1.40 g/cm3
(5)氣味	：無味
(6)可溶性	：不溶於水
(7)物理型態	：固體

10. 穩定性及反應性 Stability and Reactivity

穩定，無預期危險反應

11. 毒性資料 (Toxicological Information)

A-PET 膠片為無毒性產品。

12. 生態資料 (Ecological Information)

A-PET 膠片對生態環境無害。

13. 廢棄處置方式 (Disposal Considerations)

融化後可回收再利用或在適當的場所燃燒。

14. 運送資料 (Transport Information)

依據中華民國道路運輸指導方針，屬於無危險產品。

15. 法規資料 (Regulatory Information)

依據中華民國勞工安全指導方針，屬於無危險材料。

16. 其他資料 (Other Information)

此份資料表是依據我們現有的知識撰寫。

僅能代表我們對自身產品的安全要求，並不能作為任何產品之保證。

SAFETY DATA SHEET

Version：Jan. 2017

For chemicals and chemical products according to **A-PET Sheet**

01. Product and Company Identification

Trade Name：A-PET Sheet

Product / Supplier：Far Eastern New Century Corporation

ADDRESS: 369, Ya-Tung sec, Wen Shan Road, Hsinpu, Hsinchu, Taiwan, R.O.C.

TEL：(03)6209000

FAX：(03)6209057

02. Hazard Identification

Chemical Hazard Classification : No dangerous material

Other hazards : None

03. Composition, Information on Ingredients

Chemical characteristic： Polyethylene Terephthalate Copolymer

CAS No. : 25038-59-9

04. First Aid Measures

After inhalation： None

After skin contact：No reaction

After eye contact : No reaction

Ingestion : No immediate harm, but it's recommended to go hospital.

This product is non-toxic and doesn't any adverse reactions.

05. Fire Fighting Measures

Suitable Extinguisher：Water-Spray, CO_2, Foam, Powder

Combustion products or gases produced：H2O,CO2, if oxygen is deficient also CO

Special Fire Fighting Procedures : None

Special Protective Equipment : None

06. Measures in case of unintentional release

Safety measures related to persons： None

Environmental measures：None

Cleaning procedure：Physical removal (e.g. Sweep up)

07. Handling and Storage

Avoid from high temperature and Sun irradiation

08. Exposure Controls, Personal Protection

Safety gloves to avoid scrape

09. Physical and Chemical Properties

(1) Absolute viscosity (IV): >0.65 measure by Ubbelohde viscometer within 60/40 percenntage in Phenol/1,1,2,2 tetrachloroenthane solvent at 30℃

(2) Melting point or range ：250 ± 5 ℃measure by DSC

(3) Glass transition temperature：65~72℃

(4) Density ：1.30~1.40 g/cm3

(5)Smell ：Odorless

(6)Solubility ：Insoluble in water

(7)Physical ：Solid

10. Stability and Reactivity

Stability：Stable

Reactivity：No dangerous reactions to be expected

11. Toxicological Information

APET Sheet are non-toxic products

12. Ecological Information

APET Sheet are environmentally friendly

13. Disposal Considerations

Reuse of melt, storage in official land-fills or combustion in suitable plants

14. Transport Information

No dangerous product, according to the R.O.C. transport guidelines for roads etc.

15. Regulatory Information

No dangerous material, according to the R.O.C. safety guidelines for laborer etc.

16. Other Information

The information in this data-sheet represents the state of the art according to our present day knowledge.

The information given in the data-sheet describes only the safety request for our product and do not guarantee any product properties.

Signature Not Verified
For Question
Please Contact with SGS
www.sgs.com.tw

測試報告
Test Report

號碼(No.): CC/2018/A0011　日期(Date): 2018/10/05　

遠東新世紀股份有限公司
FAR EASTERN NEW CENTURY CORPORATION
新竹縣新埔鎮文山里3鄰文山路亞東段369號
369, YA-TUNG SEC., WEN SHAN ROAD, 3 LIN, WEN SHAN LII, HSINPU, HSINCHU, TAIWAN, R. O. C.

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/on behalf of the applicant as):

送樣廠商(Sample Submitted By)	:	遠東新世紀股份有限公司 (FAR EASTERN NEW CENTURY CORPORATION)
樣品名稱(Sample Description)	:	APET SHEET
樣品型號(Style/Item No.)	:	(B□●XX~ B□●XX)　□=A、C、D、E、P、S、T　●=F、H、0~9 BESIDE 7
買主/訂單號碼(Buyer/Order No.)	:	GLOBAL CUSTOMERS
收件日期(Sample Receiving Date)	:	2018/10/01
測試期間(Testing Period)	:	2018/10/01 TO 2018/10/05

==========

測試需求(Test Requested) : 依據客戶指定，參考REACH之Regulation (EC) No 1907/2006的公告進行以下測試 / As specified by client, the sample(s) was/were tested with reference to Regulation (EC) No 1907/2006 concerning the REACH.
■ 191項高關注物質候選清單，於2018年06月27日公告 / 191 Substances of Very High Concern (SVHC). Candidate list is published on 2018 June 27

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

總結(Summary) : 根據歐洲法院對於REACH規範下成品定義的裁決以及指定範圍和分析技術，送測樣品中所選擇的零部件成品的高關注物質(SVHC) 測試結果濃度均小於0.1%(w/w) / According to the ruling of the Court of Justice of the European Union on the definition of an article under REACH, and the specified scope as well as analytical technique, the test results of the selected component article are ≤ 0.1% (w/w) in the submitted sample(s).

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

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測試報告
Test Report

遠東新世紀股份有限公司
FAR EASTERN NEW CENTURY CORPORATION
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369, YA-TUNG SEC., WEN SHAN ROAD, 3 LIN, WEN SHAN LII, HSINPU, HSINCHU, TAIWAN, R. O. C.

測試樣品(Test Sample):　透明塑膠片 (TRANSPARENT PLASTIC SHEET)

測試方法(Test Method):
參照SGS內部方法RSTS-EE-SVHC-007. 由感應耦合電漿原子發射光譜儀、紫外光可見光譜儀、氣相層析/質譜儀、液相層析/質譜儀、氣相層析儀/火焰光度偵測器、液相層析/質譜儀/二極體陣列偵測器、超高效能液相層析串聯質譜儀進行分析。(SGS In-House method-RSTS-EE-SVHC-007. Analyzed by ICP-AES, UV-VIS, GC/MS, LC/MS, GC/FPD, LC/MS/DAD, UPLC-MSMS.)

測試結果 (Test Results)

No.	物質名稱 (Substance Name)	RL (%)	濃度 (Concentration) (%)
1.	4,4' - 二氨基二苯甲烷 / 4,4' - Diaminodiphenylmethane (MDA) (CAS No.: 101-77-9)	0.05	n.d.
2.	二甲苯麝香 / 5-tert-butyl-2,4,6-trinitro- m-xylene (Musk Xylene) (CAS No.: 81-15-2)	0.05	n.d.
3.	短鏈氯化石蠟 / Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins) (CAS No.: 85535-84-8)	0.05	n.d.
4.	蒽 / Anthracene (CAS No.: 120-12-7)	0.05	n.d.
5.	鄰苯二甲酸丁苯甲酯 / BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	0.05	n.d.
6.	氧化雙三丁基錫 / Bis(tributyltin)oxide (TBTO)*** (CAS No.: 56-35-9)	-	n.d.
7.	五氧化二砷 / Diarsenic pentaoxide*** (CAS No.: 1303-28-2)	-	n.d.
8.	三氧化二砷 / Diarsenic trioxide*** (CAS No.: 1327-53-3)	-	n.d.
9.	鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	0.05	n.d.
10.	六溴環十二烷及所有主要被辨別出的異構物 / Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α- HBCDD, β- HBCDD, γ- HBCDD) (CAS No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	0.05	n.d.
11.	砷酸氫鉛 / Lead hydrogen arsenate*** (CAS No.: 7784-40-9) (※1)	-	n.d.
12.	重鉻酸鈉 / Sodium dichromate*** (CAS No.: 7789-12-0; 10588-01-9(*))	-	n.d.
13.	三乙基砷酸酯 / Triethyl arsenate*** (CAS No.: 15606-95-8)	-	n.d.
14.	鄰苯二甲酸二 (2-乙基己基)酯 / DEHP (Bis (2-ethyl(hexyl) phthalate)) (CAS No.: 117-81-7)	0.05	n.d.
15.	2,4-二硝基甲苯 / 2,4-Dinitrotoluene (CAS No.: 121-14-2)	0.05	n.d.
16.	蒽油 / Anthracene oil (CAS No.: 90640-80-5) (**)	0.05	n.d.
17.	蒽油, 蒽糊 / Anthracene oil, anthracene paste (CAS No.: 90640-81-6) (**)	0.05	n.d.
18.	蒽油, 蒽糊, 蒽餾分 / Anthracene oil, anthracene paste, anthracene fraction (CAS No.: 91995-15-2) (**)	0.05	n.d.

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No.	物質名稱 (Substance Name)	RL (%)	濃度 (Concentration) (%)
19.	蒽油, 蒽糊, 輕油 / Anthracene oil, anthracene paste, distn. Lights (CAS No.: 91995-17-4) (**)	0.05	n.d.
20.	蒽油, 含蒽量少 / Anthracene oil, anthracene-low (CAS No.: 90640-82-7) (**)	0.05	n.d.
21.	鄰苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	0.05	n.d.
22.	鉻酸鉛 / Lead chromate*** (CAS No.: 7758-97-6) (※5)	-	n.d.
23.	鉬鉻紅；顏色索引: 顏料紅104 / Lead chromate molybdate sulphate red*** (C.I. Pigment Red 104) (CAS No.: 12656-85-8) (※5)	-	n.d.
24.	鉻酸鉛；顏色索引: 顏料黃34 / Lead sulfochromate yellow*** (C.I. Pigment Yellow 34) (CAS No.: 1344-37-2) (※5)	-	n.d.
25.	煤瀝青, 高溫 / Pitch, coal tar, high-temp. (CAS No.: 65996-93-2) (**)	0.05	n.d.
26.	磷酸三 (2-氯乙基)酯 / Tris(2-chloroethyl) phosphate (TCEP) (CAS No.: 115-96-8)	0.05	n.d.
27.	丙烯醯胺 / Acrylamide (CAS No.: 79-06-1)	0.05	n.d.
28.	重鉻酸銨 / Ammonium dichromate*** (CAS No.: 7789-09-5)	-	n.d.
29.	硼酸 / Boric acid*** (CAS No.: 10043-35-3; 11113-50-1)	-	n.d.
30.	無水四硼酸二鈉 / Disodium tetraborate, anhydrous*** (CAS No.: 1303-96-4, 1330-43-4, 12179-04-3)	-	n.d.
31.	鉻酸鉀 / Potassium chromate*** (CAS No.: 7789-00-6)	-	n.d.
32.	重鉻酸鉀 / Potassium dichromate*** (CAS No.: 7778-50-9)	-	n.d.
33.	鉻酸鈉 / Sodium chromate*** (CAS No.: 7775-11-3)	-	n.d.
34.	水合硼酸鈉 / Tetraboron disodium heptaoxide, hydrate (CAS No.: 12267-73-1) (*2)	-	n.d.
35.	三氯乙烯 / Trichloroethylene (CAS No.: 79-01-6)	0.05	n.d.
36.	乙二醇乙醚 / 2-Ethoxyethanol (CAS No.: 110-80-5)	0.05	n.d.
37.	乙二醇甲醚 / 2-Methoxyethanol (CAS No.: 109-86-4)	0.05	n.d.
38.	從三氧化鉻與其它寡聚體生成的酸類: 鉻酸 / Acids generated from chromium trioxide and their oligomers: Chromic acid*** (CAS No.: 7738-94-5)	-	n.d.
	從三氧化鉻與其它寡聚體生成的酸類: 重鉻酸 / Acids generated from chromium trioxide and their oligomers: Dichromic acid*** (CAS No.: 13530-68-2)	-	n.d.
	從三氧化鉻與其它寡聚體生成的酸類: 鉻酸與重鉻酸的寡聚體 / Acids generated from chromium trioxide and their oligomers: Oligomers of chromic acid and dichromic acid (*1)	-	n.d.

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No.	物質名稱 (Substance Name)	RL (%)	濃度 (Concentration) (%)
39.	三氧化鉻 / Chromium trioxide ***(CAS No.: 1333-82-0)	-	n.d.
40.	碳酸鈷(二價) / Cobalt(II) carbonate*** (CAS No.: 513-79-1)	-	n.d.
41.	醋酸鈷(二價) / Cobalt(II) diacetate*** (CAS No.: 71-48-7)	-	n.d.
42.	硝酸鈷(二價) / Cobalt(II) dinitrate*** (CAS No.: 10141-05-6)	-	n.d.
43.	硫酸鈷(二價) / Cobalt(II) sulphate*** (CAS No.: 10124-43-3)	-	n.d.
44.	1,2,3-三氯丙烷 / 1,2,3-trichloropropane (CAS No.: 96-18-4)	0.05	n.d.
45.	鄰苯二甲酸二 (C6-8支鏈)烷基酯，富C7 / 1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP) (CAS No.: 71888-89-6)	0.05	n.d.
46.	鄰苯二甲酸二 (C7-11支鏈與直鏈)烷基酯 / 1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP) (CAS No.: 68515-42-4)	0.05	n.d.
47.	N-甲基吡咯烷酮 / 1-methyl-2-pyrrolidone (CAS No.: 872-50-4)	0.05	n.d.
48.	乙二醇乙醚乙酸酯 / 2-ethoxyethyl acetate (CAS No.: 111-15-9)	0.05	n.d.
49.	聯氨 / Hydrazine (CAS No.: 7803-57-8; 302-01-2)	0.05	n.d.
50.	鉻酸鍶 / Strontium chromate*** (CAS No.: 7789-06-2)	-	n.d.
51.	二氯化鈷 / Cobalt dichloride (CAS No.: 7646-79-9)	0.005	n.d.
52.	1,2-二氯乙烷 / 1,2-Dichloroethane (CAS No.: 107-06-2)	0.05	n.d.
53.	4,4'-亞甲雙 (2-氯苯胺) / 2,2'-dichloro- 4,4'-methylenedianiline (MOCA) (CAS No.: 101-14-4)	0.05	n.d.
54.	鄰甲氧基苯胺 / 2-Methoxyaniline; o-Anisidine (CAS No.: 90-04-0)	0.05	n.d.
55.	對特辛基苯酚 / 辛基酚 / 4-(1,1,3,3-tetramethylbutyl) phenol, (4-tert-Octylphenol) (CAS No.: 140-66-9)	0.05	n.d.
56.	矽酸鋁，耐火陶瓷纖維 (主要成分濃度於可變範圍內) / Aluminosilicate, Refractory Ceramic Fibres【oxides of aluminium and silicon are the main components present (in the fibres) within variable concentration ranges】	0.05	n.d.
57.	砷酸 / Arsenic acid*** (CAS No.: 7778-39-4)	-	n.d.
58.	双(2-甲氧基乙基)醚 / Bis(2-methoxyethyl) ether (CAS No.: 111-96-6)	0.05	n.d.
59.	鄰苯二甲酸二甲氧基乙酯 / Bis(2-methoxyethyl) phthalate (CAS No.: 117-82-8)	0.05	n.d.
60.	砷酸鈣 / Calcium arsenate*** (CAS No.: 7778-44-1)	-	n.d.
61.	鉻酸鉻 / Dichromium tris (chromate)*** (CAS No.: 24613-89-6)	-	n.d.

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No.	物質名稱 (Substance Name)	RL (%)	濃度 (Concentration) (%)
62.	甲醛與苯胺的寡聚體 / Formaldehyde, oligomeric reaction products with aniline (technical MDA) (CAS No.: 25214-70-4)	0.05	n.d.
63.	疊氮化鉛 / Lead diazide, Lead azide*** (CAS No.: 13424-46-9)	-	n.d.
64.	苦味酸鉛 / Lead dipicrate*** (CAS No.: 6477-64-1)	-	n.d.
65.	中性斯蒂酚酸鉛 / Lead styphnate*** (CAS No.: 15245-44-0)	-	n.d.
66.	N,N-二甲基乙醯胺 / N,N-dimethylacetamide (DMAC) (CAS No.: 127-19-5)	0.05	n.d.
67.	八氫氧化五鉻酸鋅 / Pentazinc chromate octahydroxide*** (CAS No.: 49663-84-5)	-	n.d.
68.	酚酞 / Phenolphthalein (CAS No.: 77-09-8)	0.05	n.d.
69.	氫氧化鉻酸鋅鉀 / Potassium hydroxyoctaoxodizincatedi- chromate*** (CAS No.: 11103-86-9)	-	n.d.
70.	砷酸鉛 / Trilead diarsenate*** (CAS No.: 3687-31-8) (※1)	-	n.d.
71.	鋯矽酸鋁，耐火陶瓷纖維（主要成分濃度於可變範圍內）/ Zirconia Aluminosilicate, Refractory Ceramic Fibres 【oxides of aluminium, silicon and zirconium are the main components present (in the fibres) within variable concentration ranges】	0.05	n.d.
72.	鹼性藍 26 [內含≥ 0.1% 的米氏酮或米氏鹼] / [4-[[4-anilino-1-naphthyl] [4-(dimethylamino) phenyl] methylene] cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Blue 26) (CAS No.: 2580-56-5) [with ≥ 0.1% of Michler's ketone or Michler's base]	0.05	n.d.
73.	鹼性紫 3 [內含≥ 0.1% 的米氏酮或米氏鹼] / [4-[4,4'-bis(dimethylamino) benzhydrylidene] cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Violet 3) (CAS No.: 548-62-9) [with ≥ 0.1% of Michler's ketone or Michler's base]	0.05	n.d.
74.	三甘醇二甲醚 / 1,2-bis (2-methoxyethoxy) ethane (TEGDME; triglyme) (CAS No.: 112-49-2)	0.05	n.d.
75.	乙二醇二甲醚 / 1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME) (CAS No.: 110-71-4)	0.05	n.d.
76.	異氰尿酸三縮水甘油酯 / TGIC (1,3,5-tris(oxiranylmethyl)- 1,3,5-triazine-2,4,6 (1H,3H,5H)-trione) (CAS No.: 2451-62-9)	0.05	n.d.
77.	異氰尿酸β-三縮水甘油酯 / β-TGIC (1,3,5-tris [(2S and 2R)-2,3-epoxypropyl]-1,3,5-triazine-2,4,6- (1H,3H,5H)-trione) (CAS No.: 59653-74-6) (※3)	0.05	n.d.

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測試報告
Test Report

遠東新世紀股份有限公司
FAR EASTERN NEW CENTURY CORPORATION
新竹縣新埔鎮文山里3鄰文山路亞東段369號
369, YA-TUNG SEC., WEN SHAN ROAD, 3 LIN, WEN SHAN LII, HSINPU, HSINCHU, TAIWAN, R. O. C.

No.	物質名稱 (Substance Name)	RL (%)	濃度 (Concentration) (%)
78.	α, α-二[(二甲氨基)苯基]-4-甲氨基苯甲醇 [內含≥ 0.1% 的米氏酮或米氏鹼] / 4,4'-bis (dimethylamino)-4''-(methylamino) trityl alcohol (CAS No.: 561-41-1) [with ≥ 0.1% of Michler's ketone or Michler's base]	0.05	n.d.
79.	4,4'-二(N,N-二甲氨基)二苯甲酮 (米氏酮) / 4,4'-bis (dimethylamino) benzophenone (Michler's ketone) (CAS No.: 90-94-8)	0.05	n.d.
80.	三氧化二硼 / Diboron trioxide*** (CAS No.: 1303-86-2)	-	n.d.
81.	甲醯胺 / Formamide (CAS No.: 75-12-7)	0.05	n.d.
82.	甲基磺酸鉛 / Lead(II) bis(methanesulfonate)*** (CAS No.: 17570-76-2)	-	n.d.
83.	4,4'-(对二甲氨基)二苯基甲烷 (米氏鹼) / N,N,N',N'-tetramethyl- 4,4'-methylenedianiline (Michler's base) (CAS No.: 101-61-1)	0.05	n.d.
84.	溶劑藍 4 [內含≥ 0.1% 的米氏酮或米氏鹼] / α,α-Bis[4-(dimethylamino) phenyl]-4 (phenylamino) naphthalene-1-methanol (C.I. Solvent Blue 4) (CAS No.: 6786-83-0) [with ≥ 0.1% of Michler's ketone or Michler's base]	0.05	n.d.
85.	[1,2-苯二羧酸根合]二氧化三鉛 / [Phthalato(2-)] dioxotrilead*** (CAS No.: 69011-06-9)	-	n.d.
86.	支鏈和直鏈1,2-苯二羧二戊酯 / 1,2-Benzenedicarboxylic acid, dipentylester, branched and linear (CAS No.: 84777-06-0)	0.05	n.d.
87.	乙二醇二乙醚 / 1,2-Diethoxyethane (CAS No.: 629-14-1)	0.05	n.d.
88.	正丙基溴 / 1-bromopropane (CAS No.: 106-94-5)	0.05	n.d.
89.	3-乙基-2-甲基-2-(3-甲基丁基)-1,3-惡唑烷 / 3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine (CAS No.: 143860-04-2)	0.05	n.d.
90.	4-(1,1,3,3-四甲基丁基)苯酚, 乙氧基 [以及所有的被定義的物質，未知成分或可變成分的物質，聚合物和同系物] / 4-(1,1,3,3-tetramethylbutyl) phenol, ethoxylated [covering well-defined substances and UVCB substances, polymers and homologues]	0.05	n.d.
91.	4,4'-二氨基-3,3'-二甲基聯苯基甲烷 / 4,4'-methylenedi-o-toluidine (CAS No.: 838-88-0)	0.05	n.d.
92.	4,4'-二氨基二苯醚 / 4,4'-oxydianiline and its salts (CAS No.: 101-80-4)	0.05	n.d.
93.	4-苯基偶氮基苯胺 / 4-Aminoazobenzene (CAS No.: 60-09-3)	0.05	n.d.
94.	2,4-二氨基甲苯 / 4-methyl-m-phenylenediamine (2,4-toluenediamine) (CAS No.: 95-80-7)	0.05	n.d.

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No.	物質名稱 (Substance Name)	RL (%)	濃度 (Concentration) (%)
95.	分支或線性的壬基酚，包括含有9個碳烷基鏈的所有獨立的同分異構體和所有含有線性或分支9個碳烷基鏈的UVCB物質 / 4-Nonylphenol, branched and linear [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof]	0.05	n.d.
96.	3-甲基-6-甲氧基苯胺 / 6-methoxy-m-toluidine (p-cresidine) (CAS No.: 120-71-8)	0.05	n.d.
97.	堿式醋酸鉛 / Acetic acid, lead salt, basic*** (CAS No.: 51404-69-4)	-	n.d.
98.	4-胺基聯苯 / Biphenyl-4-ylamine (CAS No.: 92-67-1)	0.05	n.d.
99.	十溴聯苯醚 / Bis(pentabromophenyl) ether (DecaBDE) (CAS No.: 1163-19-5)	0.05	n.d.
100.	六氫苯二甲酸酐 / Cyclohexane-1,2-dicarboxylic anhydride (HHPA), cis-cyclohexane-1,2- dicarboxylic anhydride, trans-cyclohexane-1,2- dicarboxylic anhydride (Hexahydrophthalic anhydride - HHPA) (CAS No.: 85-42-7, 13149-00-3, 14166-21-3)	0.05	n.d.
101.	偶氮[二]甲醯胺 / Diazene-1,2-dicarboxamide (C,C'-azodi(formamide)) (CAS No.: 123-77-3)	0.05	n.d.
102.	二氯二丁基錫 / Dibutyltin dichloride (DBTC)*** (CAS No.: 683-18-1)	-	n.d.
103.	硫酸二乙酯 / Diethyl sulphate (CAS No.: 64-67-5)	0.05	n.d.
104.	鄰苯二甲酸二異戊酯 / Diisopentylphthalate (CAS No.: 605-50-5)	0.05	n.d.
105.	硫酸二甲酯 / Dimethyl sulphate (CAS No.: 77-78-1)	0.05	n.d.
106.	2-(1-甲基丙基)-4,6-二硝基苯酚 / Dinoseb (CAS No.: 88-85-7)	0.05	n.d.
107.	雙(十八酸基)二氧代三鉛 / Dioxobis(stearato) trilead*** (CAS No.: 12578-12-0)	-	n.d.
108.	C16-18-脂肪酸鉛鹽 / Fatty acids, C16-18, lead salts*** (CAS No.: 91031-62-8)	-	n.d.
109.	呋喃 / Furan (CAS No.: 110-00-9)	0.05	n.d.
110.	全氟十一酸 / Henicosafluoroundecanoic acid (CAS No.: 2058-94-8)	0.05	n.d.
111.	全氟十四酸 / Heptacosafluorotetradecanoic acid (CAS No.: 376-06-7)	0.05	n.d.
112.	甲基六氫苯酐 / Hexahydromethylphathalic anhydride (CAS No.: 25550-51-0) 4-甲基六氫苯酐 / Hexahydro-4-methylphathalic anhydride (CAS No.: 19438-60-9) 1-甲基六氫苯酐 / Hexahydro-1-methylphathalic anhydride (CAS No.: 48122-14-1) 3-甲基六氫苯酐 / Hexahydro-3-methylphathalic anhydride (CAS No.: 57110-29-9)	0.05	n.d.
113.	四氟硼酸鉛 (II) / Lead bis(tetrafluoroborate)*** (CAS No.: 13814-96-5)	-	n.d.
114.	氨基氰鉛鹽 / Lead cyanamidate*** (CAS No.: 20837-86-9)	-	n.d.

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No.	物質名稱 (Substance Name)	RL (%)	濃度 (Concentration) (%)
115.	硝酸鉛 / Lead dinitrate*** (CAS No.: 10099-74-8)	-	n.d.
116.	氧化鉛 / Lead oxide (lead monoxide)*** (CAS No.: 1317-36-8)	-	n.d.
117.	堿式硫酸鉛 / Lead oxide sulfate*** (CAS No.: 12036-76-9)	-	n.d.
118.	鈦酸鉛 / Lead titanium trioxide*** (CAS No.: 12060-00-3)	-	n.d.
119.	鈦酸鉛鋯 / Lead Titanium Zirconium Oxide*** (CAS No.: 12626-81-2)	-	n.d.
120.	甲氧基乙酸 / Methoxy acetic acid (CAS No.: 625-45-6)	0.05	n.d.
121.	環氧丙烷 / Propylene oxide; 1,2-epoxypropane; methyloxirane (CAS No.: 75-56-9)	0.05	n.d.
122.	N,N-二甲基甲醯胺 / N,N-dimethylformamide; dimethyl formamide (CAS No.: 68-12-2)	0.05	n.d.
123.	N-甲基乙醯胺 / N-methylacetamide (CAS No.: 79-16-3)	0.05	n.d.
124.	鄰苯二甲酸正戊異戊酯 / N-pentyl-isopentylphtalate (CAS No.: 776297-69-9)	0.05	n.d.
125.	鄰氨基偶氮甲苯 / o-aminoazotoluene (CAS No.: 97-56-3)	0.05	n.d.
126.	四氧化鉛 / Lead tetroxide (orange lead)*** (CAS No.: 1314-41-6)	-	n.d.
127.	鄰甲苯胺 / o-Toluidine; 2-Aminotoluene (CAS No.: 95-53-4)	0.05	n.d.
128.	全氟十三酸 / Pentacosafluorotridecanoic acid (CAS No.: 72629-94-8)	0.05	n.d.
129.	氧化鉛與硫酸鉛的複合物 / Pentalead tetraoxide sulphate*** (CAS No.: 12065-90-6)	-	n.d.
130.	C.I.顏料黃41 / Pyrochlore, antimony lead yellow*** (CAS No.: 8012-00-8)	-	n.d.
131.	含鉛的矽酸鋇 / Silicic acid, barium salt, lead-doped (※4) (CAS No.: 68784-75-8)	0.05	n.d.
132.	矽酸鉛 / Silicic acid, lead salt*** (CAS No.: 11120-22-2)	-	n.d.
133.	亞硫酸鉛(II) / Sulfurous acid, lead salt, dibasic*** (CAS No.: 62229-08-7)	-	n.d.
134.	四乙基鉛 / Tetraethyllead*** (CAS No.: 78-00-2)	-	n.d.
135.	三鹼式硫酸鉛/ C.I. 顏料白 / Tetralead trioxide sulphate*** (CAS No.: 12202-17-4)	-	n.d.
136.	全氟十二酸 / Tricosafluorododecanoic acid (CAS No.: 307-55-1)	0.05	n.d.
137.	堿式碳酸鉛 / Trilead bis(carbonate) dihydroxide (basic lead carbonate)*** (CAS No.: 1319-46-6)	-	n.d.
138.	磷酸氧化鉛 / Trilead dioxide phosphonate*** (CAS No.: 12141-20-7)	-	n.d.
139.	分支或線性的乙氧化壬基酚，包括含有9個碳烷基鏈的所有獨立的同分異構體和所有含有線性或分支9個碳烷基鏈的UVCB物質 / 4-Nonylphenol, branched and linear, ethoxylated [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, ethoxylated covering UVCB- and well-defined substances, polymers and homologues, which include any of the individual isomers and/or combinations thereof]	0.05	n.d.

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No.	物質名稱 (Substance Name)	RL (%)	濃度 (Concentration) (%)
140.	全氟辛酸銨 / Ammoniumpentadecafluorooctanoate (APFO)*** (CAS No.: 3825-26-1)	-	n.d.
141.	鎘 / Cadmium (Cd) (CAS No.: 7440-43-9)	0.005	n.d.
142.	氧化鎘 / Cadmium oxide*** (CAS No.: 1306-19-0)	-	n.d.
143.	鄰苯二甲酸二戊酯 / Dipentyl phthalate (CAS No.: 131-18-0)	0.05	n.d.
144.	全氟辛酸 / Pentadecafluorooctanoic acid (PFOA) (CAS No.: 335-67-1)	0.05	n.d.
145.	硫化鎘 / Cadmium sulphide*** (CAS No.: 1306-23-6)	-	n.d.
146.	鄰苯二甲酸二己酯 / Dihexyl phthalate (CAS No.: 84-75-3)	0.05	n.d.
147.	直接紅28 / Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate) (C.I. Direct Red 28) (CAS No.: 573-58-0)	0.05	n.d.
148.	直接黑38 / Disodium 4-amino-3-[[4'-[(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo] -5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate (C.I. Direct Black 38) (CAS No.: 1937-37-7)	0.05	n.d.
149.	亞乙基硫脲 / Imidazolidine-2-thione; 2-imidazoline-2-thiol (CAS No.: 96-45-7)	0.05	n.d.
150.	醋酸鉛 / Lead di(acetate)*** (CAS No.: 301-04-2)	-	n.d.
151.	磷酸三(二甲苯)酯 / Trixylyl phosphate (CAS No.: 25155-23-1)	0.05	n.d.
152.	鄰苯二甲酸二己酯(支鏈和直鏈) / 1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear (CAS No.: 68515-50-4)	0.05	n.d.
153.	氯化鎘 / Cadmium chloride*** (CAS No.: 10108-64-2)	-	n.d.
154.	過硼酸鈉 / Sodium perborate; perboric acid, sodium salt***	-	n.d.
155.	過氧偏硼酸鈉 / Sodium peroxometaborate*** (CAS No.: 7632-04-4)	-	n.d.
156.	2-(2'-羥基-3',5'-二-叔-戊基苯基)苯並三唑 (紫外線吸收劑328) / 2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328) (CAS No.: 25973-55-1)	0.05	n.d.
157.	2-[2-羥基-3',5'-二-叔-丁基苯基]-苯並三唑 (紫外線吸收劑320) / 2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320) (CAS No.: 3846-71-7)	0.05	n.d.
158.	二正辛基-雙(2-乙基己基巯基乙酸酯)錫 / 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)*** (CAS No.: 15571-58-1)	-	n.d.
159.	氟化鎘 / Cadmium fluoride*** (CAS No.: 7790-79-6)	-	n.d.
160.	硫酸鎘 / Cadmium sulphate*** (CAS No.: 10124-36-4; 31119-53-6)	-	n.d.

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No.	物質名稱 (Substance Name)	RL (%)	濃度 (Concentration) (%)
161.	二正辛基-雙(2-乙基己基巯基乙酸酯)錫和單辛基-三(2-乙基己基巯基乙酸酯)錫的反應物 / Reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE)***	-	n.d.
162.	鄰苯二甲酸二(C6-10)烷基酯; 鄰苯二甲酸二己、二辛、二癸酯混合物;鄰苯二甲酸二己酯 ≧ 0.3% / 1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with ≧ 0.3% of dihexyl phthalate (CAS No.: 68515-51-5; 68648-93-1)	0.05	n.d.
163.	5-二級丁基-2-(2,4-二甲基環己-3-烯-1-基)-5-甲基-1,3-二氧環己烷[1],5-二級丁基-2-(4,6-二甲基環己-3-烯-1-基)-5-甲基-1,3-二氧環己烷[2],[任何[1]和[2]或者其任意組合的單獨異構物或其任何組合] / 5-sec-butyl-2-(2,4-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [1], 5-sec-butyl-2-(4,6-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [2] [covering any of the individual isomers of [1] and [2] or any combination thereof]	0.05	n.d.
164.	1,3-丙烷磺内酯 / 1,3-propanesultone (CAS No.: 1120-71-4)	0.05	n.d.
165.	2,4-二-叔丁基-6-(5-氯-2H-苯并三唑-2-基)苯酚(紫外線吸收劑327) / 2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327) (CAS No.: 3864-99-1)	0.05	n.d.
166.	2-(3-仲-丁基-5-叔丁基-2-羟苯基)苯并三唑(紫外線吸收劑 UV-350) / 2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-350) (CAS No.: 36437-37-3)	0.05	n.d.
167.	硝基苯 / Nitrobenzene (CAS No.: 98-95-3)	0.05	n.d.
168.	全氟壬酸 / Perfluorononan-1-oic acid (2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,9-heptadecafluorononanoic acid and its sodium and ammonium salts (CAS No.: 375-95-1; 21049-39-8; 4149-60-4)	0.05	n.d.
169.	苯并(a)芘 / Benzo[def]chrysene (Benzo[a]pyrene) (CAS No.: 50-32-8)	0.05	n.d.
170.	雙酚A / 4,4'- isopropylidenediphenol (Bisphenol A) (CAS No.: 80-05-7)	0.05	n.d.
171.	4-庚基苯酚，支鍊及直鍊 (4-HPbl)，包括含有7個碳烷基鏈的所有獨立的同分異構體和所有含有線性或分支7個碳烷基鏈的UVCB物質 / 4-Heptylphenol, branched and linear (4-HPbl) [substances with a linear and/or branched alkyl chain with a carbon number of 7 covalently bound predominantly in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof]	0.05	n.d.

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No.	物質名稱 (Substance Name)	RL (%)	濃度 (Concentration) (%)
172.	十九氟癸酸及其鈉和銨鹽 / Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts (CAS No.: 3108-42-7, 335-76-2, 3830-45-3)	0.05	n.d.
173.	對(1,1-二甲基丙基)苯酚 / p-(1,1- dimethylpropyl) phenol (PTAP) (CAS No.: 80-46-6)	0.05	n.d.
174.	全氟己基磺酸及其鹽類 / Perfluorohexane-1-sulphonic acid and its salts (PFHxS) (CAS No.: 355-46-4)	0.05	n.d.
175.	德克隆(涵蓋各個反式及順式同分易構物或者相關組合) / 1,6,7,8,9,14,15,16,17, 17,18,18-Dodecachloropentacyclo [12.2.1.16,9.02,13.05,10]octadeca-7,15-diene ("Dechlorane Plus" TM) [covering any of its individual anti- and syn-isomers or any combination thereof]	0.05	n.d.
176.	苯並[a]蒽 / Benz[a]anthracene (CAS No.: 56-55-3)	0.05	n.d.
177.	硝酸鎘 / Cadmium nitrate*** (CAS No.: 10325-94-7)	-	n.d.
178.	碳酸鎘 / Cadmium carbonate*** (CAS No.: 513-78-0)	-	n.d.
179.	氫氧化鎘 / Cadmium hydroxide*** (CAS No.: 21041-95-2)	-	n.d.
180.	苯並[a]菲 / Chrysene (CAS No.: 218-01-9)	0.05	n.d.
181.	1,3,4-噻唑烷-2,5-二硫酮，甲醛及4-庚基苯酚支鏈及直鏈反應物, (RP-HP) [含≥0.1% w/w 支鏈及直鏈4-庚基苯酚] / Reaction products of 1,3,4-thiadiazolidine-2,5-dithione, formaldehyde and 4-heptylphenol, branched and linear (RP-HP) [with ≥0.1% w/w 4-heptylphenol, branched and linear] (※7)	-	n.d.
182.	鄰苯二甲酸二環己酯 / Dicyclohexyl phthalate (DCHP) (CAS No.: 84-61-7)	0.05	n.d.
183.	1,2,4-苯三甲酸酐 / Benzene-1,2,4- tricarboxylic acid 1,2- anhydride (trimellitic anhydride) (CAS No.: 552-30-7)	0.05	n.d.
184.	苯並(G,H,I)苝 / Benzo[ghi]perylene (CAS No.: 191-24-2)	0.05	n.d.
185.	八甲基環四矽氧烷 / Octamethylcyclotetrasiloxane (D4) (CAS No.: 556-67-2)	0.05	n.d.
186.	十甲基環五矽氧烷 / Decamethylcyclopentasiloxane (D5) (CAS No.: 541-02-6)	0.05	n.d.
187.	十二甲基環六矽氧烷 / Dodecamethylcyclohexasiloxane (D6) (CAS No.: 540-97-6)	0.05	n.d.
188.	氧化硼鈉 / Disodium octaborate*** (CAS No.: 12008-41-2)	-	n.d.
189.	乙二胺 / Ethylenediamine (CAS No.: 107-15-3)	0.05	n.d.
190.	鉛 / Lead (Pb) (CAS No.: 7439-92-1) (●)	0.005	n.d.
191.	氫化三聯苯 / Terphenyl hydrogenated (CAS No.: 61788-32-7)	0.05	n.d.

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Remark：

1. 高關注物質(SVHC)候選清單 / Candidate List of SVHC (2018/06/27)
   http://echa.europa.eu/web/guest/candidate-list-table
2. 根據Regulation (EC) No 1907/2006 中第7條款第2項之規定，如果物質合乎第57條款之標準以及可依據第59(1)條之規定鑑別，且同時符合下列兩項狀況，任何成品之製造人和進口人應向歐洲化學總署(ECHA)通報：
   (a) 成品中所含物質每年超過1公噸。
   (b) 依重量百分比計算，物質濃度超過0.1% 。
   In accordance with Regulation (EC) No 1907/2006, any producer or importer of articles shall notify ECHA, in accordance with paragraph 2 of Article 7, if a substance meets the criteria in Article 57 and is identified in accordance with Article 59(1) of the Regulation,
   if (a) the substance is present in those articles in quantities totaling over one tonne per producer or importer per year; and (b) the substance is present in those articles above a concentration of 0.1% weight by weight (w/w).
3. Regulation (EC) No 1907/2006中第 33 條要求成品供應商，其成品所含物質符合第57條款的標準並依照第59(1)條款確定其濃度大於0.1wt%，應提供成品接受者充份可取得資訊，以確保成品的安全使用(至少包括物質的名稱)。
   Article 33 of Regulation (EC) No 1907/2006 requires supplier of an article containing a substance meeting the criteria in Article 57 and identified in accordance with Article 59(1) in a concentration above 0.1% weight by weight (w/w) shall provide the recipient of the article with sufficient information, available to the supplier, to allow safe use of the article including, as a minimum, the name of that substance.
4. 如果樣品中高關注物質的濃度超過0.1% (w/w)和/或歐盟(EC)No.1272/2008 CLP法規及其修訂中設定的特殊濃度限值，建議客戶根據歐盟REACH法規No.1907/2006對有關高關注物質準備安全資料表(SDS)以符合供應鏈通信的義務，如：
   (I) 根據(EC)No.1272/2008 CLP法規被列為有害物質。
   (II) 根據(EC)No.1272/2008 CLP法規被列為有害混合物，而當中物質的濃度大於或等於(EC)No.1272/2008 CLP法規列出的濃度限值;或
   (III) 根據(EC)No.1272/2008 CLP法規並未列為有害混合物，但包含：
   (a) 對人類健康或環境有害的物質，而在固體或液體混合物(即非氣體混合物)中其濃度≥1%(w/w)或在氣體混合物中占體積≥0.2%，或
   (b) PBT或vPvB物質，在固體或液體混合物(即非氣體混合物)中個別濃度≥0.1%(w/w)，或
   (c) 授權審議的高關注物質候選清單上的物質(除上述以外的原因)在個別非氣體混合物中的濃度≥0.1%(w/w)，或
   If a SVHC is found over 0.1% (w/w) and/or the specific concentration limit which is set in Regulation (EC) No 1272/2008 and its amendments, client is suggested to prepare a Safety Data Sheet (SDS) against the SVHC to comply with the supply chain communication obligation under Regulation (EC) No 1907/2006, in which:
   (I) a substance that is classified as hazardous under the CLP Regulation (EC) No 1272/2008.
   (II) mixture that is classified as hazardous under the CLP Regulation (EC) No 1272/2008, when it contains a substance with concentration equal to, or greater than the classification limit as set in Regulation (EC) No. 1272/2008; or
   (III) a mixture is not classified as hazardous under the CLP Regulation (EC) No 1272/2008, but contains either:
   (a) a substance posing human health or environmental hazards in an individual concentration of ≥ 1 % by weight for mixtures that are solid or liquids (i.e., non-gaseous mixtures) or ≥ 0.2 % by volume for gaseous mixtures; or

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(b) a substance that is PBT, or vPvB in an individual concentration of ≥ 0.1 % by weight for mixtures that are solid or liquids (i.e., non-gaseous mixtures); or
(c) a substance on the SVHC candidate list (for reasons other than those listed above), in an individual concentration of ≥ 0.1 % by weight for non-gaseous mixtures; or
(d) a substance for which there are Europe-wide workplace exposure limits

5. 倘若SVHC超出報告極限值，建議客戶確認含有該SVHC的零件，並要求實驗室進一步的定量分析而取得SVHC的確切濃度。
If a SVHC is found over the reporting limit, client is suggested to identify the component which contains the SVHC and the exact concentration of the SVHC by requesting further quantitative analysis from the laboratory.

備註(Note)：

1. mg/kg = ppm；0.1wt% = 1000ppm
2. RL = Reporting Limit / 報告極限值
3. n.d. = not detected = below Reporting Limit / 未檢出
4. "-" = Not Regulated / 無規格值
5. (*): 重鉻酸鈉二水合物(CAS No.: 7789-12-0)含量 = 重鉻酸鈉含量 × 1.1375
(conc. of Sodium dichromate dihydrate = conc. of sodium dichromate × 1.1375)
6. (**): 上述混合物的濃度是經由所獲得的成分比例介於被選擇標靶物及混合物所推估出來. / The concentrations of above-mentioned mixtures are evaluated per the gained composition rate between the selected marks and the mixtures.
7. ***: 該物質是由單辛基錫、二辛基錫、三丁基錫、二丁基錫、全氟辛酸或各別元素 (例如: 砷、鉛、六價鉻、硼、鈷、鋇、鎘)之測試結果計算得知. / The substance was calculated by the test results of MonooctylTin, Dioctyl Tin, Tributyl Tin, Dibutyl Tin, PFOA or element (Ex. Arsenic, Lead, Cr(VI), Boron, Cobalt, Barium, Cadmium respectively).

測試結果如下(The test result is given as):

物質名稱 (Substance Name)	RL (%)	濃度 (Concentration) (%)
三丁基錫 / Tributyl Tin (TBT)	0.05	n.d.
砷 / Arsenic (As) (※2)	0.005	n.d.
六價鉻 / Hexavalent Chromium Cr(VI)	0.005	n.d.
硼 / Boron (B) (※2)	0.005	n.d.
鈷 / Cobalt (Co)	0.005	n.d.
二丁基錫 / Dibutyl Tin (DBT)	0.05	n.d.
鋇 / Barium (Ba)	0.005	n.d.
二辛基錫 / Dioctyl Tin (DOT)	0.0231	n.d.
單辛基錫 / MonooctylTin (MOT)	0.0140	n.d.

8. F 參數換算表/F Parameter Conversion Table：http://twap.sgs.com/sgsrsts/chn/download-REACH_tw.asp

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9. 分類/Classification：Please refer to http://twap.sgs.com/sgsrsts/chn/download-REACH_tw.asp
10. (＊1): 鉻酸與重鉻酸的寡聚體: 因為其寡聚體是由未知數的鉻酸或與重鉻酸所組成，而導致沒有固定分子量，因此以單體鉻酸或重鉻酸較為重要並應被考慮。/ Oligomers of chromic acid and dichromic acid : since the oligomers are made of the unknown amount of chromic acid or dichromic acid that results in no fixed molecular weight, therefore the monomer of chromic acid or dichromic acid is relevant and considered.
11. (＊2): 水合硼酸鈉: 依照歐洲化學總署解釋以無水四硼酸二鈉數據作為代表(歐洲化學總署回信編號 Ref no.: INC 000000032519) / Tetraboron disodium heptaoxide, hydrate: Only anhydrous form of disodium tetraborate is relevant and considered according to ECHA explanation (Ref no.: INC 000000032519).
12. (※1): 此砷鉛化合物之濃度是取砷及鉛兩者各別換算出砷鉛化合物濃度，並取其最小值做為最後出報告之依據.
(Regarding the compound containing arsenic and lead, lead and arsenic are tested and respectively used for the calculation of the independent concentration of the compound containing arsenic and lead. The minimum value of the two independently calculated concentrations is used as the final concentration for the report.)
13. (※2): 被萃取出的溶出硼/砷是以感應耦合電漿原子發射光譜儀檢測得之. / The extracted soluble Boron / Arsenic are detected by ICP-AES.
14. (※3): 由於TGIC本身含有β-TGIC，依照ECHA 技術文件 β-TGIC與 TGIC 約為 1:10 比例，因此β-TGIC將以1/10 的TGIC計算濃度。/ TGIC is a mixture and also contains β-TGIC. According to the ECHA's technical dossier the ratio of β-TGIC to TGIC is around 1 to 10. Therefore β-TGIC is issued based on the above-mentioned ratio.
15. (※4): 只有在矽與鉛定性結果為陽性時，再以鋇之濃度換算之。/ Only if both qualitative results of lead and silicon are positive, the test result of the compound will be calculated based on the concentration of barium.
16. (※5): 此化合物之濃度是取六價鉻及鉛兩者各別換算出化合物濃度，並取其最小值做為最後出報告之依據.
(Regarding the compound containing Cr(VI) and lead, lead and Cr(VI) are tested and respectively used for the calculation of the independent concentration of the compound containing Cr(VI) and lead. The minimum value of the two independently calculated concentrations is used as the final concentration for the report.)
17. (※7): RP-HP無法直接測得且無法自特定元素計算含量，RP-HP之所以被定義於SVHC是因為4-HPbl，因此分析4-HPbl取代RP-HP. / RP-HP can't be identified directly and test result can't be calculated based on specific element(s) or compound. RP-HP is identified as SVHC because of 4-HPbl, therefore 4-HPbl is analysed instead of RP-HP.
18. (●) : 因為鉛有一很廣泛應用，不太可能判定是否檢驗出的鉛是來自鉛離子，鉛元素或鉛化合物，因此用檢驗出的總鉛來代表鉛。 / Since lead has a wide application, it is unlikely to determine if the detected lead comes from the lead ion, lead element or/ and lead compounds. Therefore the detected total lead is used on behalf of lead.

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SVHC 分析流程圖 / Analytical flow chart of SVHC

- 測試人員：涂雅苓, 陳恩臻 / Technician: Yaling Tu, Rita Chen
- 測試負責人：張啟興 / Supervisor: Troy Chang

取樣 / Sampling

↓

樣品以酸消化，溶劑萃取預處理 /
Sample pretreated by acid digestion, solvent extraction

↓

由感應耦合電漿原子發射光譜儀、紫外光可見光譜儀、氣相層析/質譜儀、液相層析質譜儀、氣相層析儀/火焰光度偵測器、液相層析/質譜儀/二極體陣列偵測器、超高效能液相層析串聯質譜儀進行分析。/
Analyzed by ICP-AES, UV-VIS, GC/MS, LC/MS, GC/FPD, LC/MS/DAD, UPLC-MSMS.

↓

數據 / Data

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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.)

CC/2018/A0011

** 報告結尾(End of Report) **

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測試報告
Test Report

號碼(No.) : CE/2018/A0172　　日期(Date) : 2018/10/05　　頁數(Page): 1 of 18

遠東新世紀股份有限公司
FAR EASTERN NEW CENTURY CORPORATION
新竹縣新埔鎮文山里3鄰文山路亞東段369號
369, YA-TUNG SEC., WEN SHAN ROAD, 3 LIN, WEN SHAN LII, HSINPU, HSINCHU, TAIWAN, R. O. C.

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/on behalf of the applicant as)：

送樣廠商(Sample Submitted By)	:	遠東新世紀股份有限公司 (FAR EASTERN NEW CENTURY CORPORATION)
樣品名稱(Sample Description)	:	APET SHEET
樣品型號(Style/Item No.)	:	(B□●XX~ B□●XX)　□=A、C、D、E、P、S、T　●=F、H、0~9 BESIDE 7
買主/訂單號碼(Buyer/Order No.)	:	GLOBAL CUSTOMERS
收件日期(Sample Receiving Date)	:	2018/10/01
測試期間(Testing Period)	:	2018/10/01 TO 2018/10/05

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

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測試結果(Test Results)

測試部位(PART NAME)No.1　　:　透明塑膠片 (TRANSPARENT PLASTIC SHEET)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No.1
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321-5 (2013)，以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n.d.
鉛 / Lead (Pb)	mg/kg		2	n.d.
汞 / Mercury (Hg)	mg/kg	參考IEC 62321-4 (2013)，以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-4 (2013) and performed by ICP-AES.	2	n.d.
六價鉻 / Hexavalent Chromium Cr(VI)	mg/kg	參考IEC 62321-7-2 (2017)，以UV-VIS檢測. / With reference to IEC 62321-7-2 (2017) and performed by UV-VIS.	8	n.d.
六溴環十二烷及所有主要被辨別出的異構物 / Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α- HBCDD, β- HBCDD, γ- HBCDD) (CAS No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	mg/kg	參考IEC 62321 (2008)，以氣相層析儀/質譜儀檢測. / With reference to IEC 62321 (2008). Analysis was performed by GC/MS.	5	n.d.
多氯聯苯 / Polychlorinated Biphenyls (PCBs) (CAS No.: 1336-36-3)	mg/kg	參考US EPA 3550C (2007)，以氣相層析儀/質譜儀檢測. / With reference to US EPA 3550C (2007). Analysis was performed by GC/MS.	0.5	n.d.

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No. 1
多溴聯苯總和 / Sum of PBBs	mg/kg	參考IEC 62321-6 (2015)，以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-6 (2015) and performed by GC/MS.	-	n.d.
一溴聯苯 / Monobromobiphenyl	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.
多溴聯苯醚總和 / Sum of PBDEs	mg/kg		-	n.d.
一溴聯苯醚 / Monobromodiphenyl ether	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.
鹵素 / Halogen				
鹵素 (氟) / Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	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.	50	n.d.
鹵素 (氯) / Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)	mg/kg		50	n.d.
鹵素 (溴) / Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg		50	n.d.
鹵素 (碘) / Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg		50	n.d.

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限值 (MDL)	結果 (Result) No.1
鄰苯二甲酸丁苯甲酯 / BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg	參考IEC 62321-8 (2017)，以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg		50	n.d.
鄰苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg		50	n.d.
鄰苯二甲酸二 (2-乙基己基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg		50	n.d.
鄰苯二甲酸二異癸酯 / DIDP (Di-isodecyl phthalate) (CAS No.: 26761-40-0; 68515-49-1)	mg/kg		50	n.d.
鄰苯二甲酸二異壬酯 / DINP (Di-isononyl phthalate) (CAS No.: 28553-12-0; 68515-48-0)	mg/kg		50	n.d.
鄰苯二甲酸二正辛酯 / DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	mg/kg		50	n.d.
石綿 / Asbestos				
溫石綿(白石綿) / Chrysotile (CAS No.: 12001-29-5)	%	參考EPA 600/R-93/116 (1993) / 立體顯微鏡 (SM), 分散染色式偏光顯微鏡 (DS-PLM)及X光繞射光譜分析法 (XRD) / With reference to EPA 600/R-93/116 (1993). Analysis was performed by Stereo Microscope (SM), Dispersion Staining Polarized Light Microscope (DS-PLM) and X-ray Diffraction Spectrometer (XRD).	-	Negative
鐵石綿(褐石綿) / Amosite (CAS No.: 12172-73-5)	%		-	Negative
青石綿 / Crocidolite (CAS No.: 12001-28-4)	%		-	Negative
斜方角閃石綿 / Anthophyllite (CAS No.: 77536-67-5)	%		-	Negative
透閃石綿 / Tremolite (CAS No.: 77536-68-6)	%		-	Negative
陽起石綿 / Actinolite (CAS No.: 77536-66-4)	%		-	Negative

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甲醛 / Formaldehyde (CAS No.: 50-00-0)	mg/kg	參考ISO 17226-1(2008)，以高效液相層析儀/二極體陣列偵測器檢測. / With reference to ISO 17226-1(2008). Analysis was performed by HPLC/DAD.	3	n.d.
雙酚 A / Bisphenol A (CAS No.: 80-05-7)	mg/kg	參考RSTS-CHEM-239-1 (2016)，以超高效能液相層析串聯質譜儀檢測. / With reference to RSTS-CHEM-239-1 (2016). Analysis was performed by UPLC-MSMS.	1	n.d.
全氟辛烷磺酸 / Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	mg/kg	參考CEN/TS 15968 (2010), 以液相層析儀/質譜儀檢測. / With reference to CEN/TS 15968 (2010). Analysis was performed by LC/MS.	0.01	n.d.
全氟辛酸 / PFOA (CAS No.: 335-67-1)	mg/kg		0.01	n.d.
偶氮 (AZO)				
1): 4-氨基二苯 / 4-AMINODIPHENYL (CAS No.: 92-67-1)	mg/kg	參考LFGB 82.02-2 (2013)，以氣相層析儀/質譜儀檢測. / With reference to LFGB 82.02-2 (2013). Analysis was performed by GC/MS.	3	n.d.
2): 聯苯胺 / BENZIDINE (CAS No.: 92-87-5)	mg/kg		3	n.d.
3): 4-氯鄰甲苯胺 / 4-CHLORO-O-TOLUIDINE (CAS No.: 95-69-2)	mg/kg		3	n.d.
4): 2-萘胺 / 2-NAPHTHYLAMINE (CAS No.: 91-59-8)	mg/kg		3	n.d.
5): 鄰氨基二甲基偶氮 / O-AMINOAZOTOLUENE (CAS No.: 97-56-3)	mg/kg		3	n.d.
6): 對硝基鄰甲苯胺 / 2-AMINO-4-NITROTOLUENE (CAS No.: 99-55-8)	mg/kg		3	n.d.
7): 對氯苯胺 / P-CHLOROANILINE (CAS No.: 106-47-8)	mg/kg		3	n.d.

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8): 4-甲氧基-間苯二胺 / 2,4-DIAMINOANISOLE (CAS No.: 615-05-4)	mg/kg	參考LFGB 82.02-2 (2013)，以氣相層析儀/質譜儀檢測. / With reference to LFGB 82.02-2 (2013). Analysis was performed by GC/MS.	3	n.d.
9): 4,4'-二氨基二苯甲烷 / 4,4'-DIAMINODIPHENYLMETHANE (CAS No.: 101-77-9)	mg/kg		3	n.d.
10): 3,3'-二氯聯苯胺 / 3,3'-DICHLOROBENZIDINE (CAS No.: 91-94-1)	mg/kg		3	n.d.
11): 3,3'-二甲氧基聯苯胺 / 3,3'-DIMETHOXYBENZIDINE (CAS No.: 119-90-4)	mg/kg		3	n.d.
12): 3,3'-二甲基聯苯胺 / 3,3'-DIMETHYLBENZIDINE (CAS No.: 119-93-7)	mg/kg		3	n.d.
13): 3,3'-二甲基-4,4'-二氨基二苯甲烷 / 3,3'-DIMETHYL-4,4'-DIAMINODIPHENYLMETHANE (CAS No.: 838-88-0)	mg/kg		3	n.d.
14): 2-甲氧基-5-甲基聯苯 / P-CRESIDINE (2-METHOXY-5-METHYLANILINE) (CAS No.: 120-71-8)	mg/kg		3	n.d.
15): 4,4'-亞甲基雙 (氯苯胺) / 4,4'-METHYLENE-BIS- (2-CHLOROANILINE) (CAS No.: 101-14-4)	mg/kg		3	n.d.
16): 4,4'-氧化雙苯胺 / 4,4'-OXYDIANILINE (CAS No.: 101-80-4)	mg/kg		3	n.d.
17): 4,4'-硫代雙苯胺 / 4,4'-THIODIANILINE (CAS No.: 139-65-1)	mg/kg		3	n.d.
18): 鄰甲苯胺 / O-TOLUIDINE (CAS No.: 95-53-4)	mg/kg		3	n.d.
19): 2,4-二氨基甲苯 / 2,4-TOLUYLENEDIAMINE (CAS No.: 95-80-7)	mg/kg		3	n.d.

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20): 2,4,5-三甲基苯胺 / 2,4,5-TRIMETHYLANILINE (CAS No.: 137-17-7)	mg/kg	參考LFGB 82.02-2 (2013)，以氣相層析儀/質譜儀檢測. / With reference to LFGB 82.02-2 (2013). Analysis was performed by GC/MS.	3	n.d.
21): 鄰位甲氧基苯胺 / O-ANISIDINE (CAS No.: 90-04-0)	mg/kg		3	n.d.
22): 對氨基偶氮苯 / 4-AMINOAZOBENZENE (CAS No.: 60-09-3)	mg/kg		3	n.d.
23): 2,4-二甲基苯胺 / 2,4-XYLIDINE (CAS No.: 95-68-1)	mg/kg		3	n.d.
24): 2,6-二甲基苯胺 / 2,6-XYLIDINE (CAS No.: 87-62-7)	mg/kg		3	n.d.

備註(Note)：

1. mg/kg = ppm；0.1wt% = 1000ppm
2. n.d. = Not Detected (未檢出)
3. MDL = Method Detection Limit (方法偵測極限值)
4. "-" = Not Regulated (無規格值)
5. 石綿定性分析試驗範圍： <0.1%~100%，石綿鑑定的判定基準是以檢出含有石綿纖維為『Positive』，未檢出石綿纖維為『Negative』。/ Testing range of asbestos qualitative analysis is from less than 0.1% to 100%. The judgment criterion: asbestos fibers being found is shown as "Positive"; asbestos fibers not being found is shown as "Negative".

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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）

- 測試人員：陳恩臻 / Technician : Rita Chen
- 測試負責人：張啟興 / Supervisor: Troy Chang

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多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBB/PBDE

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor: Troy Chang

初次測試程序 / First testing process
選擇性篩檢程序 / Optional screen process
確認程序 / Confirmation process

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

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor : Troy Chang

【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

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor: Troy Chang

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

- 測試人員：陳恩臻 / Technician: Rita Chen
- 測試負責人：張啟興 / Supervisor: Troy Chang

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多氯聯苯分析流程圖 / Analytical flow chart - PCBs

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor : Troy Chang

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石綿鑑定分析流程圖 / Analysis flow chart for determination of Asbestos

- 測試人員：高鍵忠 / Technician: Victor Kao
- 測試負責人：魏明芬 / Supervisor: Wendy Wei

【參考方法(Reference method): EPA 600/R-93/116】

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

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor: Troy Chang

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雙酚A分析流程圖 / Analytical flow chart - Bisphenol A

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor: Troy Chang

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全氟辛酸/全氟辛烷磺酸分析流程圖 / Analytical flow chart - PFOA/PFOS

- 測試人員：涂雅苓 / Technician: Yaling Tu
- 測試負責人：張啟興 / Supervisor: Troy Chang

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測試報告
Test Report

遠東新世紀股份有限公司
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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.)

CE/2018/A0172

** 報告結尾 (End of Report) **

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