

# 承认书

SPECIFICATION FOR APPROVAL

客 户  
CUSTOMER MARITEX Leszek LOSIN sp. jawna

品 名  
PART NAME FFC CABLES

料 号  
PART NO. A0.5x20x60-4488b1T

| 样品提供(SAMPLE PROVIDE) |          |             |
|----------------------|----------|-------------|
| 工程 Engineering       | 业务 Sales | 核准 Approval |
|                      |          |             |

| 客户承认(CUSTOMER APPROVAL) |        |             |
|-------------------------|--------|-------------|
| 工程 Engineering          | 品管 Q.C | 核准 Approval |
|                         |        |             |

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## FFC 系列

Scope: This specification covers the FLAT FLEXIBLE CABLE series.

适用范围: 此规格书适用于扁平软排线

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|----------|----------|----------|-------|---------|
| FILE NO  | ENS008   | APPROVAL | CHECK | DRAWING |
| ECR/N NO | New spec |          |       |         |

[1. Construction and materials/构造和材料]

| ITEM 项目                 | DESCRIPTION 描述 |   |
|-------------------------|----------------|---|
| Insulation<br>绝缘体       | Material 材料    | Flame retardant polyester 阻燃性聚酯                     |
|                         | Color 颜色       | White 白色  |
| Conductor<br>导体         | Material 材料    | Copper with 1um min. tin-plating 镀锡扁平方角铜线, 锡层厚1um以上 |
|                         | Size 尺寸        | 参考图纸  |
| Reinforcing<br>Tape 补强板 | Material 材料    | Flame retardant polyester 阻燃性聚酯                     |
|                         | Color 颜色       | Blue 蓝色   |

[2. Rated voltage and current/额定电压和电流]

| ITEM 项目                               | STANDARD 标准        |
|---------------------------------------|--------------------|
| Part NO/名称                            | A0.5x20x60-4488b1T |
| Conductor Size (Thickness*Width)/导体间距 | 0.035mm x 0.3mm    |
| Rated Voltage/额定电压                    | 60V                |
| Rated Current/额定电流                    | 0.5A (环境温度45°C以下)  |
| Operating Temperature/适用温度            | -30°C ~ +80°C      |
| Keeping Temperature/仓储温度              | -30°C ~ +85°C      |

[3. Performance/特性]

3-1. Electrical Performance/电气特性

| ITEM 项目                                       | Test condition 测试条件  | Requirement 要求            |
|---|--|---------------------------|
| 3-1-1<br><br>Conductor<br>resistance<br>导体电阻  | Based upon JIS C-3102 at 20°<br>依JIS C-3102测试, 环境温度 20°                              | 0.1x1.27mm 0.2Ω/m (max.)  |
|   |  | 0.1x0.8mm 0.4Ω/m (max.)   |
|   |  | 0.1x0.7mm 0.5Ω/m (max.)   |
|   |  | 0.05x0.8mm 0.7Ω/m (max.)  |
|   |  | 0.05x0.65mm 0.8Ω/m (max.) |
|   |  | 0.05x0.5mm 1Ω/m (max.)    |
|   |  | 0.035*0.65mm 1Ω/m (max.)  |
|   |  | 0.035*0.3mm 2Ω/m (max.)   |
| 3-1-2<br><br>Insulation<br>resistance<br>绝缘阻抗 | Apply 500V DC between adjacent conductors.<br>相邻两导体间接500V直流电压测试。                     | 1000MΩ (min.)             |
| 3-1-3<br><br>Dielectric<br>strength<br>耐高压    | Apply 500V AC for 1minute between adjacent<br>conductors.<br>相邻两导体间接500V交流电压, 持续1分钟。 | No breakdown<br>不能击穿      |
| 3-1-4<br><br>Continuity<br>通电                 | Continuity tester DC3.0V, 0.1mA 通电器测试  | No open/short<br>无断路及短路   |

3-2. Mechanical Performance/物理特性

| ITEM 项目                           | TEST CONDITION 测试条件                  | Requirement 要求      |
|-----------------------------------|--------------------------------------|---------------------|
| 3-2-1<br><br>Flexibility<br>柔韧性测试 | 180° folding test 弯折180°             | > 20 cycles(回)      |
|                                   | 15mm R, 1000 cycles/min. 25mm stroke | > 100,000 cycles(回) |

|       |                        |                            |  |                   |
|-------|------------------------|----------------------------|--|-------------------|
| 3-2-2 | Abrasion test<br>耐磨测试  | Ø0.5mm, 600g 60cycles/min. |  | >10,000 cycles(回) |
| 3-2-3 | Insert/Extract<br>插拔测试 |                            |  | ≥20times(次)       |
| 3-2-4 | Insulation<br>绝缘体      | Elongation<br>延伸率          | Based upon JIS-K-6732<br>依JIS-K-6732测试 | ≥60%              |
|       |                        | Tensile strength<br>抗拉强度   | Based upon JIS-K-6732<br>依JIS-K-6732测试 | ≥3.5KG/sq.mm      |
|       | Conductor<br>导体        | Elongation<br>延伸率          | Based upon JIS-K-6732<br>依JIS-K-6732测试 | ≥15%              |

3-3. Environmental Performance/环境特性

| ITEM 项目 |                               | Test condition 测试条件  | Requirement 要求  |
|---------|-------------------------------|--|---|
| 3-3-1   | Heat resistance<br>耐热性测试      | The cable shall be placed in an oven for 96 hours at +85°C<br>将线放入+85°C测试环境中96小时，然后测试绝缘阻抗及耐压   | Insulation resistance and dielectric strength pass<br>绝缘阻抗及耐压测试正常 |
| 3-3-2   | Humidity<br>耐湿性测试             | The cable shall be placed in a humidity chamber on the following conditions.<br>Temperature: 40°C<br>Relative humidity: 95%<br>Duration : 96 hours<br>将线放入恒温恒湿机内96小时，然后测试绝缘阻抗及耐压 | Insulation resistance and dielectric strength pass<br>绝缘阻抗及耐压测试正常 |
| 3-3-3   | Temperature cycling<br>温度循环测试 | The cable shall be set to temperature cycling for 5 cycles of which 1 cycle consists of :<br>-40°C for 4 hours<br>+85°C for 4 hours<br>+25°C for 1 hours<br>以上述温度循环条件测试          | Insulation resistance and dielectric strength pass<br>绝缘阻抗及耐压测试正常 |
| 3-3-4   | Burn test<br>燃烧试验             | UL 1581标准  | VW-1合格  |

[4. Product shape, Dimensions and materials/产品形状、尺寸和材料]

Refer to the drawing/参考图纸

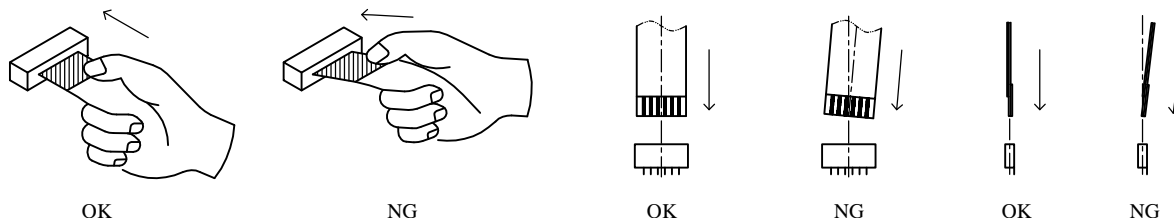
## FFC使用和保管的注意事项及说明

### 一, FFC使用上的注意事项

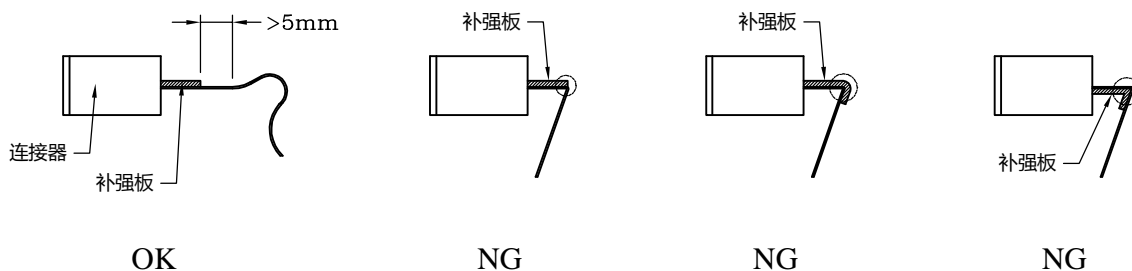
1. 插接时拇指与食指须捏住FFC的补强板, 尽可能朝着连接器插座口的中心及垂直方向插拔。



2. 插接时用力方向及插接端须与连接器的插座口保持在同一水平面上, 以避免FFC在插接处折弯。



3. 使用时, 在补强板的外围尽量不要加上极端的负荷, 在不得已的情况下, 要考虑加长 FFC 的长度使其不处于拉伸状态。补强板位置绝对不能弯折, 那样易产生铜线折断的现象。



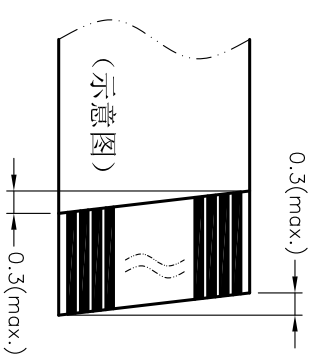
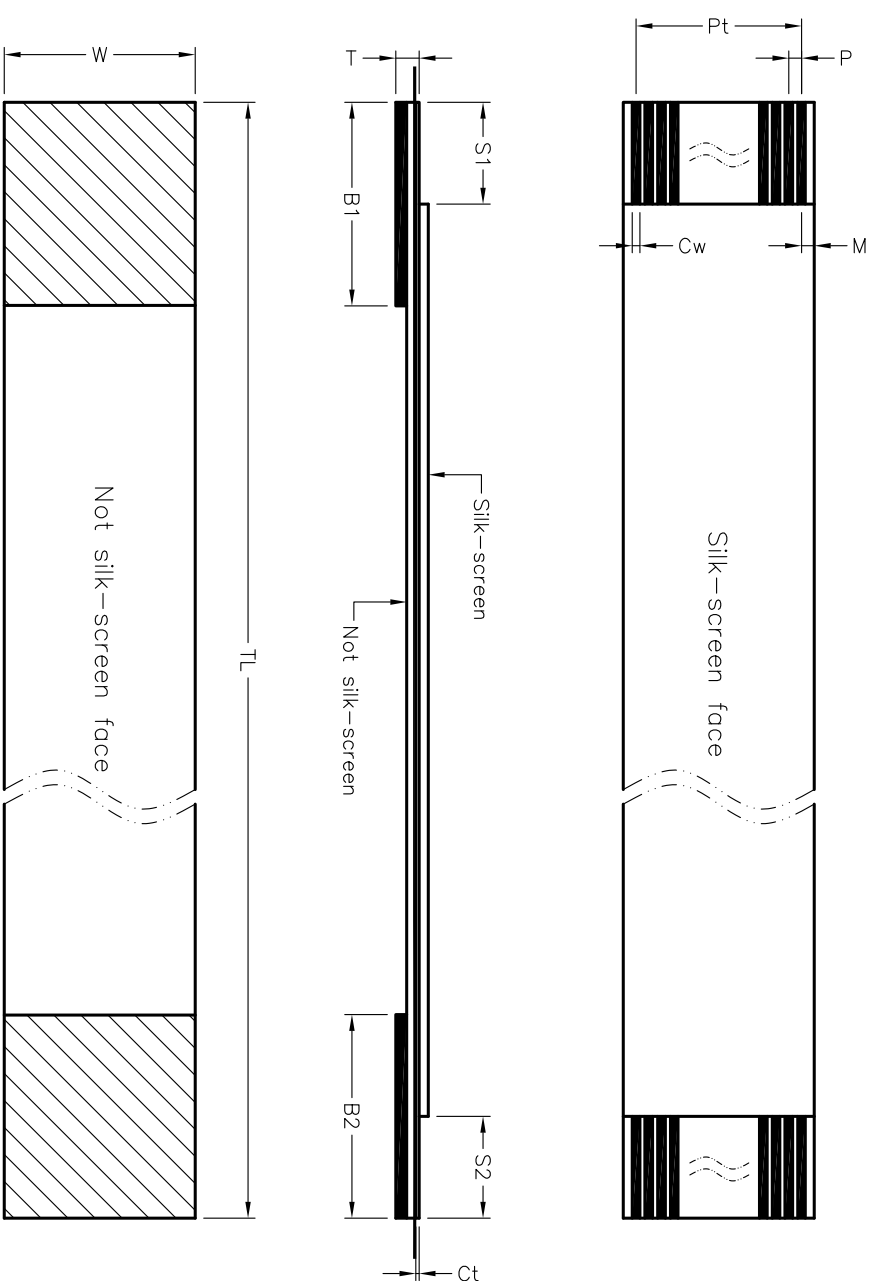
4. 插接时, 误把FFC掉落地上时, 导体外露部分须清理干净后再使用。
5. 操作时应避免手指直接接触导体外露部分, 若必须接触, 建议带手套或指套作业。

### 二, FFC保管上的注意事项

1. 请储存在阴凉干燥的场所, 温度要求16~27°C, 湿度65RH%以下, 避免阳光直射。
2. 室内储存时请放置在胶垫或货架上, 防止受潮。
3. 注意防尘, 并远离腐蚀性气体及有机溶剂。
3. 保质期为半年, 逾期使用时需对其相关特性进行复检, 方可使用。

| BOM |                                  |   |  |
|-----|----------------------------------|---|--|
| No. | Item                             | Specification                                   | Remarks                                    |
| 1   | Insulation film                  | JINDA UL20624<br>White PET(43 $\mu$ m)          | flame retardant<br>rating VW-1             |
| 2   | Reinforcement plate              | Blue PET(225 $\mu$ m)                           |  |
| 3   | Conductors<br>(Flat copper wire) | Thickness 0.035mm<br>Width 0.30mm<br>Plating Sn | $\pm 0.005$<br>$\pm 0.03$<br>$\geq 1\mu$ m |
| 4   | Number of<br>Conductors          | N   | 20   |

| Dimensions (Unit: mm) |                                 |    |            |
|-----------------------|---------------------------------|----|------------|
| 1                     | Total length                    | TL | $\pm 2$    |
| 2                     | Total width                     | W  | $\pm 0.1$  |
| 3                     | Margin width                    | M  | $\pm 0.1$  |
| 4                     | Pitch                           | P  | $\pm 0.08$ |
| 5                     | Span                            | Pt | $\pm 0.1$  |
| 6                     | Thickness of<br>connection area | T  | $\pm 0.05$ |
| 7                     | Strip length                    | S1 | 4          |
|                       |                                 | S2 | 4          |
| 8                     | Reinforcemen length             | B1 | 8          |
|                       |                                 | B2 | 8          |



**JINDA**  
Dongguan Jinda Electronics Co., Ltd  
东莞市津达电子有限公司

| GENERAL TOLERANCE |                    |
|-------------------|--------------------|
| XX: $\pm 0.40$    |                    |
| X: $\pm 0.30$     |                    |
| .X: $\pm 0.25$    | X*: $\pm 2^\circ$  |
| .XX: $\pm 0.15$   | .X*: $\pm 1^\circ$ |

|              |                      |                |
|--------------|----------------------|----------------|
| SCALE: 3.5:1 | DRAWN: Luoshengrong  | DATE: 2023.8.9 |
| UNIT: mm     | CHECK:               | DATE:          |
| SIZE: A4     | APPROVE: Xiaozhi jun | DATE: 2023.8.9 |

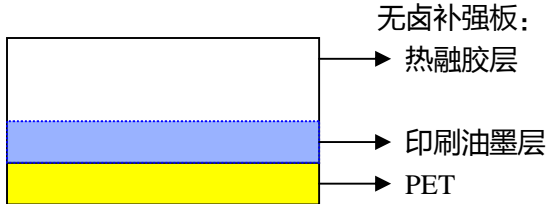
|                              |            |            |
|------------------------------|------------|------------|
| DOCUMENT NO: JD-Y-EF001      | TITLE: 工程图 | REV. A     |
| PARTS NO: A0.5*20X60-4488b1T |            | SHEET: 1/1 |



## 材质证明

- 1、我司生产的无卤补强板，主要由 PET、热融胶层和印刷油墨组成。PET 主要用途是绝缘、油墨主要用途是印刷颜色、涂料主要用途是粘合。
- 2、无卤补强板符合卤素法规要求。

如下图视：



| 序号 | 品名          | 型号             | PET 厚度<br>( $\mu\text{m}$ ) | 印刷油墨厚度<br>( $\mu\text{m}$ ) | 热融胶层<br>厚度( $\mu\text{m}$ ) | 重量比例     | 涂料    |
|----|-------------|----------------|-----------------------------|-----------------------------|-----------------------------|----------|-------|
| 1  | 无卤白色综合型补强板  | LEB25-55SW     | 25                          | 1                           | 29                          | 1.1: 0.2 | 无卤综合型 |
| 2  | 无卤蓝色综合型补强板  | LEB75-100S     | 75                          | 1                           | 24                          | 1.1: 0.2 | 无卤综合型 |
| 3  | 无卤黑色综合型补强板  | LEBH100-130S   | 100                         | 1                           | 29                          | 1.1: 0.2 | 无卤综合型 |
| 4  | 无卤透明综合型补强板  | LEB100-130ST   | 100                         | 0                           | 30                          | 1.1: 0.2 | 无卤综合型 |
| 5  | 无卤蓝色综合型补强板  | LEB100-130S    | 100                         | 1                           | 29                          | 1.1: 0.2 | 无卤综合型 |
| 6  | 无卤浅蓝色综合型补强板 | LEB100-130SQ   | 100                         | 1                           | 29                          | 1.1: 0.2 | 无卤综合型 |
| 7  | 无卤紫色综合型补强板  | LEB100-130SZ   | 100                         | 1                           | 29                          | 1.1: 0.2 | 无卤综合型 |
| 8  | 无卤蓝色综合型补强板  | LEB125-160S    | 125                         | 1                           | 34                          | 1.1: 0.2 | 无卤综合型 |
| 9  | 无卤紫色综合型补强板  | LEB125-160SZ   | 125                         | 1                           | 34                          | 1.1: 0.2 | 无卤综合型 |
| 10 | 无卤浅蓝色综合型补强板 | LEB125-160SQ   | 125                         | 1                           | 34                          | 1.1: 0.2 | 无卤综合型 |
| 11 | 无卤高温补强板     | LEB125-160A    | 125                         | 1                           | 34                          | 1.1: 0.2 | 无卤高温  |
| 12 | 无卤高温补强板     | LEB150-183A    | 150                         | 1                           | 32                          | 1.1: 0.2 | 无卤高温  |
| 13 | 无卤蓝色综合型补强板  | LEB150-183S    | 150                         | 1                           | 32                          | 1.1: 0.2 | 无卤综合型 |
| 14 | 无卤蓝色综合型补强板  | LEB150-183SQ   | 150                         | 1                           | 32                          | 1.1: 0.2 | 无卤综合型 |
| 15 | 无卤蓝色不透明补强板  | LEB150-183ACZY | 150                         | 1                           | 32                          | 1.1: 0.2 | 无卤高温  |
| 16 | 无卤蓝色综合型补强板  | LEB175-205S    | 175                         | 1                           | 29                          | 1.1: 0.2 | 无卤综合型 |
| 17 | 无卤蓝色综合型补强板  | LEB175-205SQ   | 175                         | 1                           | 29                          | 1.1: 0.2 | 无卤综合型 |
| 18 | 无卤透明综合型补强板  | LEB188-215ST   | 188                         | 0                           | 27                          | 1.1: 0.2 | 无卤综合型 |
| 19 | 无卤蓝色综合型补强板  | LEB188-225S    | 188                         | 1                           | 36                          | 1.1: 0.2 | 无卤综合型 |
| 20 | 无卤高温补强板     | LEB188-225A    | 188                         | 1                           | 36                          | 1.1: 0.2 | 无卤高温  |
| 21 | 无卤浅蓝色高温补强板  | LEB188-225AQ   | 188                         | 1                           | 36                          | 1.1: 0.2 | 无卤高温  |
| 22 | 无卤绿色高温补强板   | LEB188-225AL   | 188                         | 1                           | 36                          | 1.1: 0.2 | 无卤高温  |
| 23 | 无卤白色高温补强板   | LEB188-225AW   | 188                         | 1                           | 36                          | 1.1: 0.2 | 无卤高温  |
| 24 | 无卤浅蓝色综合型补强板 | LEB188-225SQ   | 188                         | 1                           | 36                          | 1.1: 0.2 | 无卤综合型 |
| 25 | 无卤蓝色不透明补强板  | LEB188-225ACZY | 188                         | 1                           | 36                          | 1.1: 0.2 | 无卤高温  |
| 26 | 无卤蓝色综合型补强板  | LEB215-250S    | 215                         | 1                           | 34                          | 1.1: 0.2 | 无卤综合型 |
| 27 | 无卤浅蓝色高温补强板  | LEB215-250AQ   | 215                         | 1                           | 34                          | 1.1: 0.2 | 无卤高温  |
| 28 | 无卤高温补强板     | LEB215-250A    | 215                         | 1                           | 34                          | 1.1: 0.2 | 无卤高温  |
| 29 | 无卤浅蓝色综合型补强板 | LEB215-250SQ   | 215                         | 1                           | 34                          | 1.1: 0.2 | 无卤综合型 |
| 30 | 无卤高温补强板     | LEB250-282A    | 250                         | 1                           | 31                          | 1.1: 0.2 | 无卤高温  |
| 31 | 无卤蓝色不透明补强板  | LEB250-282ACZY | 250                         | 1                           | 31                          | 1.1: 0.2 | 无卤综合型 |

|    |            |                |     |   |    |          |       |
|----|------------|----------------|-----|---|----|----------|-------|
| 32 | 无卤蓝色综合型补强板 | LEB250-282S    | 250 | 1 | 31 | 1.1; 0.2 | 无卤综合型 |
| 33 | 无卤高温补强板    | LEB250-282Y    | 250 | 1 | 31 | 1.1; 0.2 | 无卤高温  |
| 34 | 无卤高温补强板    | LEB250-282YCZY | 250 | 1 | 31 | 1.1; 0.2 | 无卤高温  |
| 35 | 无卤白色综合型补强板 | LEB150-183SW   | 150 | 1 | 32 | 1.1; 0.2 | 无卤综合型 |
| 36 | 无卤蓝色综合型补强板 | LEB188-215S    | 188 | 1 | 26 | 1.1; 0.2 | 无卤综合型 |
| 37 | 无卤蓝色综合型补强板 | LEB188-218SQ   | 188 | 1 | 29 | 1.1; 0.2 | 无卤综合型 |
| 38 | 无卤蓝色综合型补强板 | LEB188-225Y    | 188 | 1 | 36 | 1.1; 0.2 | 无卤高温  |
| 39 | 无卤蓝色综合型补强板 | LEB215-250Y    | 215 | 1 | 34 | 1.1; 0.2 | 无卤高温  |

制表：陈小飞

审核：吴锦彦

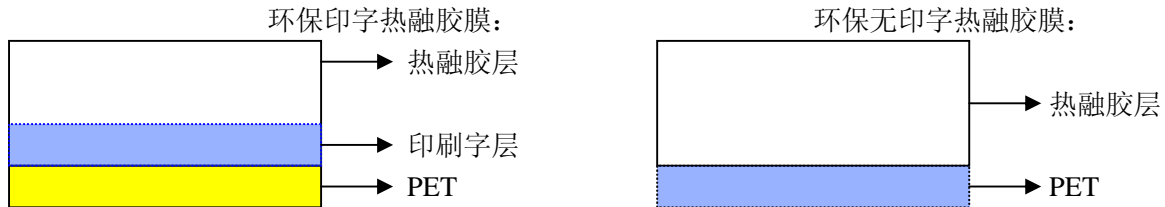




### 材质证明

- 1、我司生产的热融胶膜，主要由 PET、热融胶层和印刷油墨组成。PET 主要用途是绝缘、油墨主要用途是印字、涂料主要用途是粘合、阻燃。
- 2、环保热融胶膜符合 ROHS 法规要求。

如下图视：



| 序号 | 品名          | 型号           | PET 厚度(μ m) | 印刷字层(μ m) | 热融胶层厚度(μ m) | 重量比例       | 涂料        |
|----|-------------|--------------|-------------|-----------|-------------|------------|-----------|
| 1  | 环保无印字热融胶膜   | LEPB19-43    | 19          | 0         | 24          | 2.0: 1.9   | 80℃ ROHS  |
| 2  | 环保黑色无印字热融胶膜 | LEPBH19-43   | 19          | 1         | 23          | 2.0: 1.9   | 80℃ ROHS  |
| 3  | 环保印字热融胶膜    | LEPBZ19-43   | 19          | 1         | 23          | 2.0: 1.9   | 80℃ ROHS  |
| 4  | 环保黑色印字热融胶膜  | LEPBHZ19-43  | 19          | 1         | 23          | 2.0: 1.9   | 80℃ ROHS  |
| 5  | 环保无印字热融胶膜   | LEPB25-50    | 25          | 0         | 21          | 2.0: 2.1   | 80℃ ROHS  |
| 6  | 环保印字热融胶膜    | LEPBZ25-50   | 25          | 1         | 20          | 2.0: 2.1   | 80℃ ROHS  |
| 7  | 环保无印字热融胶膜   | LEPB25-60    | 25          | 0         | 35          | 1: 1       | 80℃ ROHS  |
| 8  | 环保黑色无印字热融胶膜 | LEPBH25-60   | 25          | 1         | 34          | 1: 1       | 80℃ ROHS  |
| 9  | 环保黑色无印字热融胶膜 | LEPBH25-70   | 25          | 1         | 44          | 1: 1       | 80℃ ROHS  |
| 10 | 环保黑色印字热融胶膜  | LEPBHZ25-70  | 25          | 1         | 44          | 1: 1       | 80℃ ROHS  |
| 11 | 环保印字热融胶膜    | LEPBZ25-60   | 25          | 1         | 34          | 1: 1       | 80℃ ROHS  |
| 12 | 环保黑色印字热融胶膜  | LEPBHZ25-60  | 25          | 1         | 34          | 1: 1       | 80℃ ROHS  |
| 13 | 环保无印字热融胶膜   | LEPB43-105   | 19          | 0         | 24          | 2.0: 1.9   | 105℃ ROHS |
| 14 | 环保印字热融胶膜    | LEPBZ43-105  | 19          | 1         | 23          | 2.0: 1.9   | 105℃ ROHS |
| 15 | 环保无印字热融胶膜   | LEPB60-105   | 25          | 0         | 35          | 1: 1       | 105℃ ROHS |
| 16 | 环保印字热融胶膜    | LEPBZ60-105  | 25          | 1         | 34          | 1: 1       | 105℃ ROHS |
| 17 | 环保无印字热融胶膜   | LEPB60-105A  | 25          | 0         | 35          | 1: 1       | 105℃ ROHS |
| 18 | 环保印字热融胶膜    | LEPBZ60-105A | 25          | 1         | 34          | 1: 1       | 105℃ ROHS |
| 19 | 环保无印字热融胶膜   | LEPB50-80    | 50          | 0         | 30          | 1: 0.6     | 80℃ ROHS  |
| 20 | 环保印字热融胶膜    | LEPBZ50-80   | 50          | 1         | 29          | 1: 0.6     | 80℃ ROHS  |
| 21 | 环保无印字热融胶膜   | LEPB32-80    | 32          | 0         | 48          | 1: 1.6     | 80℃ ROHS  |
| 22 | 环保印字热融胶膜    | LEPBZ32-80   | 32          | 1         | 47          | 1: 1.6     | 80℃ ROHS  |
| 23 | 环保无印字热融胶膜   | LEPB50-100   | 50          | 0         | 50          | 2.13: 2.42 | 80℃ ROHS  |
| 24 | 环保黑色无印字热融胶膜 | LEPBH43-105  | 19          | 1         | 24          | 2.0: 1.9   | 105℃ ROHS |
| 25 | 环保黑色无印字热融胶膜 | LEPBH60-105  | 25          | 1         | 34          | 1: 1       | 105℃ ROHS |
| 26 | 环保黑色印字热融胶膜  | LEPBHZ43-105 | 19          | 1         | 24          | 2.0: 1.9   | 105℃ ROHS |
| 27 | 环保黑色印字热融胶膜  | LEPBHZ60-105 | 25          | 1         | 34          | 1: 1       | 105℃ ROHS |
| 28 | 环保无印字热融胶膜   | LEPB65-105   | 25          | 0         | 40          | 1: 1.2     | 80℃ ROHS  |

|    |           |             |    |   |    |        |            |
|----|-----------|-------------|----|---|----|--------|------------|
| 29 | 环保有印字热融胶膜 | LEPBZ65-105 | 25 | 1 | 39 | 1: 1.2 | 105°C ROHS |
| 30 | 环保有印字热融胶膜 | LEPBZ80-105 | 32 | 1 | 47 | 1: 1.6 | 105°C ROHS |
| 31 | 环保无印字热融胶膜 | LEPB80-105  | 32 | 0 | 48 | 1: 1.6 | 105°C ROHS |

制表：陈小飞

审核：吴锦彦

# Test Report

No. CANEC2303562103

Date: 24 Mar 2023

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Client Name : GUANGDONG LEARY NEW MATERIAL TECHNOLOGY CO.,LTD

Client Address : BEISHUI INDUSTRIAL ZONE, XINGTAN TOWN, SHUNDE DISTRICT, FOSHAN CITY, GUANGDONG PROVINCE.

Sample Name : Hot melt glue film

Model No. : LEPB25-60

Client Ref. Info. : SEE REMARK

The above sample(s) and information were provided by the client.

SGS Job No. : CP23-010550 - GZ

Date of Sample Received : 13 Mar 2023

Testing Period : 13 Mar 2023 - 23 Mar 2023

Test Requested : Selected test(s) as requested by the client.

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

Test Result(s) : Please refer to next page(s).

## Result Summary :

| Test Requested   | Conclusion  |
|--|-------------|
| EU RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU- Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP) | PASS        |
| Elementary Analysis  | See Results |
| VOC  | See Results |
| Red Phosphor   | See Results |
| Phthalate  | See Results |
| AfPS GS 2019:01 PAK - Polycyclic Aromatic Hydrocarbons (PAHs)  | See Results |
| Perfluorooctanoic acid (PFOA) and its salts & Perfluorooctane sulfonates (PFOS) and its derivatives  | See Results |



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

Annie Ren

Annie Ren  
Approved Signatory

scan to see the report



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Test Result(s) :

Test Part Description :

| Specimen No. | SGS Sample ID    | Description |
|--------------|------------------|-------------|
| SN1          | CAN23-035621.003 | White sheet |

Remarks :

- (1) 1 mg/kg = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected ( < MDL )
- (4) "-" = Not Regulated

**EU RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU- Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP)**

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)                  | 1000  | mg/kg | 2   | ND  |
| Mercury (Hg)               | 1000  | mg/kg | 2   | ND  |
| Hexavalent Chromium (CrVI) | 1000  | mg/kg | 8   | ND  |
| Sum of PBBs                | 1000  | 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               | 1000  | 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  |

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| <u>Test Item(s)</u>                 | <u>Limit</u> | <u>Unit</u> | <u>MDL</u> | <u>003</u> |
|-------------------------------------|--------------|-------------|------------|------------|
| 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)             | 1000         | mg/kg       | 50         | ND         |
| Butyl benzyl phthalate (BBP)        | 1000         | mg/kg       | 50         | ND         |
| Bis (2-ethylhexyl) phthalate (DEHP) | 1000         | mg/kg       | 50         | ND         |
| Diisobutyl Phthalates (DIBP)        | 1000         | mg/kg       | 50         | ND         |

### Notes :

- (1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
- (2) IEC 62321 series is equivalent to EN 62321 series
- (3) The restriction of DEHP, BBP, DBP and DIBP shall apply to medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, from 22 July 2021.

### Elementary Analysis

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

| <u>Test Item(s)</u> | <u>Unit</u> | <u>MDL</u> | <u>003</u> |
|---------------------|-------------|------------|------------|
| Beryllium (Be)      | mg/kg       | 5          | ND         |
| Cobalt (Co)         | mg/kg       | 5          | ND         |

### Notes :

- (1) Methods is/are not accredited by CNAS.

### VOC

Test Method : With reference to SGS in-house method (GZTC CHEM-TOP-050-37), TVOC test is performed according to Samsung requirement (2020):  
TVOC analysis was performed by TVOC portable detector.  
Benzene, Toluene, Formaldehyde and Phosphine analysis were performed by gas detecting tubes.



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| <u>Test Item(s)</u> | <u>Unit</u> | <u>MDL</u> | <u>003</u>         |
|---------------------|-------------|------------|--------------------|
| Sample amount       | -           | -          | 768cm <sup>2</sup> |
| TVOC                | ppmV        | 16         | ND                 |
| Benzene             | ppmV        | 0.8        | ND                 |
| Toluene             | ppmV        | 16         | ND                 |
| Formaldehyde        | ppmV        | 0.08       | 0.10               |
| Phosphine           | ppmV        | 0.08       | ND                 |

### Notes :

1. ppmV: Part per million by volume
2. Tedlar bag: 5L
3. Test condition: 40 °C, 30min
4. Methods is/are not accredited by CNAS.

### Red Phosphor

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

| <u>Test Item(s)</u> | <u>Unit</u> | <u>MDL</u> | <u>003</u> |
|---------------------|-------------|------------|------------|
| Red phosphorus      | mg/kg       | 500        | ND         |

### Notes :

- (1) Methods is/are not accredited by CNAS.

### Phthalate

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

| <u>Test Item(s)</u>                | <u>CAS NO.</u>             | <u>Unit</u> | <u>MDL</u> | <u>003</u> |
|------------------------------------|----------------------------|-------------|------------|------------|
| Dibutyl Phthalate (DBP)            | 84-74-2                    | %(w/w)      | 0.003      | ND         |
| Bis(2-ethylhexyl) Phthalate (DEHP) | 117-81-7                   | %(w/w)      | 0.003      | ND         |
| Benzylbutyl Phthalate (BBP)        | 85-68-7                    | %(w/w)      | 0.003      | ND         |
| Di-n-octyl Phthalate (DNOP)        | 117-84-0                   | %(w/w)      | 0.003      | ND         |
| Diisononyl Phthalate (DINP)        | 28553-12-0 /<br>68515-48-0 | %(w/w)      | 0.010      | ND         |
| Diisodecyl Phthalate (DIDP)        | 26761-40-0 /<br>68515-49-1 | %(w/w)      | 0.010      | ND         |
| Di-n-hexyl Phthalate (DnHP)        | 84-75-3                    | %(w/w)      | 0.003      | ND         |
| Diisobutyl Phthalate (DIBP)        | 84-69-5                    | %(w/w)      | 0.003      | ND         |
| Diisopentyl Phthalate (DIPP)       | 605-50-5                   | %(w/w)      | 0.003      | ND         |



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| Test Item(s)   | CAS NO.               | Unit   | MDL   | 003 |
|--|-----------------------|--------|-------|-----|
| Dipentyl Phthalates (DPENP/DnPP)   | 131-18-0              | %(w/w) | 0.003 | ND  |
| n-pentyl Isopentyl Phthalate (nPIPP)   | 776297-69-9           | %(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  |
| Bis(2-methoxyethyl) Phthalate (DMEP)   | 117-82-8              | %(w/w) | 0.003 | ND  |
| 1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)  | 71888-89-6            | %(w/w) | 0.010 | ND  |
| Dicyclohexyl Phthalate (DCHP)  | 84-61-7               | %(w/w) | 0.003 | ND  |
| 1,2-Benzenedicarboxylic acid, dipentyl ester, branched and linear (DPP)  | 84777-06-0            | %(w/w) | 0.010 | ND  |
| 1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with $\geq 0.3\%$ of dihexyl phthalate | 68515-51-5/68648-93-1 | %(w/w) | 0.010 | ND  |
| 1,2-Benzenedicarboxylic acid, dihexyl ester branched and linear (DHP)  | 68515-50-4            | %(w/w) | 0.010 | ND  |
| Di-iso-hexylphthalate (DIHxP)  | 71850-09-4            | %(w/w) | 0.010 | ND  |

### Notes :

(1) DBP, BBP, DEHP, DIBP Reference information: Entry 51 of Regulation (EU) 2018/2005 amending Annex XVII of REACH Regulation (EC) No 1907/2006:

i) Shall not be used as substances or in mixtures, individually or in any combination of DBP, BBP, DEHP & DIBP, in concentrations equal to or greater than 0.1 % by weight of the plasticised material, in toys and childcare articles.

ii) Shall not be placed on the market in toys or childcare articles, individually or in any combination of DBP, BBP, DEHP, in concentrations equal to or greater than 0.1 % by weight of the plasticised material. In addition, DIBP shall not be placed on the market after 7 July 2020 in toys or childcare articles, individually or in any combination of DBP, BBP, DEHP & DIBP, in concentrations equal to or greater than 0.1 % by weight of the plasticised material.

iii) shall not be placed on the market after 7 July 2020 in articles, individually or in any combination of DBP, BBP, DEHP & DIBP, in concentrations equal to or greater than 0.1 % by weight of the plasticised material in the articles.

Please refer to Regulation (EU) 2018/2005 to get more detail information

(2) DINP, DNOP, DIDP Reference information: Entry 52 of Regulation (EU) 2015/326 amending Annex XVII of REACH Regulation (EC) No 1907/2006.

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 (EU) 2015/326 to get more detail information

(3) Methods is/are not accredited by CNAS.

## AfPS GS 2019:01 PAK - Polycyclic Aromatic Hydrocarbons (PAHs)





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Test Method : With reference to AfPS GS 2019:01 PAK, analysis was performed by GC-MS.

| <u>Test Item(s)</u>  | <u>CAS NO.</u> | <u>Unit</u> | <u>MDL</u> | <u>003</u> |
|--|----------------|-------------|------------|------------|
| Naphthalene(NAP)   | 91-20-3        | 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         |
| Sum of 4 PAHs (Phenanthrene, Pyrene, Anthracene, Fluoranthene) | -              | mg/kg       | -          | ND         |
| Sum of 15 PAHs   | -              | mg/kg       | -          | ND         |



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AfPS ( German commission for Product Safety ) : PAHs requirements

| Parameter<br>(mg/kg)   | Category 1   | Category 2   |                               | Category 3  |                               |
|--|--|--|-------------------------------|---|-------------------------------|
|  | Materials intended to be placed in the mouth, or materials coming into long-term contact with skin (more than 30s) during the intended use<br><br>-in toys according to Directive 2009/48/EC<br>or -for the use by children <sup>a,b</sup> up to 3 years of age. | Materials not covered by category 1, coming into long-term contact (more than 30s) or short-term repetitive contact <sup>c</sup> with skin during the intended or foreseeable use <sup>d</sup> . |                               | Materials covered neither by category 1 nor by category 2, coming into short-term contact (up to 30s) with skin during the intended or foreseeable use. |                               |
|  |  | a.<br>use by children  | b.<br>other consumer products | a.<br>use by children   | b.<br>other consumer products |
| Benzo(a)pyrene (BaP)   | < 0.2  | < 0.2  | < 0.5                         | < 0.5   | < 1                           |
| Benzo(e)pyrene (BeP)   | < 0.2  | < 0.2  | < 0.5                         | < 0.5   | < 1                           |
| Benzo(a)anthracene (BaA)   | < 0.2  | < 0.2  | < 0.5                         | < 0.5   | < 1                           |
| Benzo(b)fluoranthene (BbF)   | < 0.2  | < 0.2  | < 0.5                         | < 0.5   | < 1                           |
| Benzo(j)fluoranthene (BjF)   | < 0.2  | < 0.2  | < 0.5                         | < 0.5   | < 1                           |
| Benzo(k)fluoranthene (BkF)   | < 0.2  | < 0.2  | < 0.5                         | < 0.5   | < 1                           |
| Chrysene (CHR)   | < 0.2  | < 0.2  | < 0.5                         | < 0.5   | < 1                           |
| Dibenzo(a,h)anthracene (DBA)   | < 0.2  | < 0.2  | < 0.5                         | < 0.5   | < 1                           |
| Benzo(g,h,i)perylene (BPE)   | < 0.2  | < 0.2  | < 0.5                         | < 0.5   | < 1                           |
| Indeno(1,2,3-cd)pyrene (IPY)   | < 0.2  | < 0.2  | < 0.5                         | < 0.5   | < 1                           |
| Phenanthrene (PHE), pyrene (PYR), anthracene (ANT), fluoranthene (FLT) | < 1 Sum  | < 5 Sum  | < 10 Sum                      | < 20 Sum  | < 50 Sum                      |
| Naphthalene (NAP)  | < 1  | < 2  |                               | < 10  |                               |
| <b>Sum of 15 PAHs</b>  | <1   | < 5  | < 10                          | < 20  | < 50                          |

Note:

<sup>a</sup> A "Child" is legally defined as a person before reaching the age of 14 years.

<sup>b</sup> Use by children includes both active and passive contact by children.

<sup>c</sup> Definition "short-term repetitive contact" taken from REACH Annex XVII entry 50 amendment (Regulation (EC) No. 1272/2013)

<sup>d</sup> According to the definition of the German Product Safety Act (ProdSG) (chapter 1 Article 2 No. 28) "foreseeable use" shall mean the use of a product in a manner that the person placing it on the market, has not intended, but which could be reasonably foreseeable.

**Remark:** The German committee on Product Safety (AfPS) published a new PAHs document (AfPS GS 2019:01 PAK) on April 10, 2020, which will be binding for the issue of GS mark certificate from July 1, 2020.

**Perfluorooctanoic acid (PFOA) and its salts & Perfluorooctane sulfonates (PFOS) and its derivatives**

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



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# Test Report

No. CANEC2303562103

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| Test Item(s)  | CAS NO.    | Unit  | MDL   | 003 |
|---|------------|-------|-------|-----|
| Perfluorooctanoic acid (PFOA) and its salts*                    | -          | mg/kg | 0.010 | ND  |
| Perfluorooctane sulfonates (PFOS) and its salts*                | -          | mg/kg | 0.010 | ND  |
| Perfluorooctane Sulfonamide (PFOSA)                             | 754-91-6   | mg/kg | 0.010 | ND  |
| N-methylperfluoro-1-octanesulfonamide(N-MeFOSA)                 | 31506-32-8 | mg/kg | 0.010 | ND  |
| N-ethylperfluoro-1-octanesulfonamide (N-EtFOSA)                 | 4151-50-2  | mg/kg | 0.010 | ND  |
| 2-(N-methylperfluoro-1-octanesulfonamido)<br>-ethanol(N-MeFOSE) | 24448-09-7 | mg/kg | 0.010 | ND  |
| 2-(N-ethylperfluoro-1-octanesulfonamido)<br>-ethanol(N-EtFOSE)  | 1691-99-2  | mg/kg | 0.010 | ND  |
| Perfluorooctane sulfonates (PFOS) and its<br>derivatives        | -          | mg/kg | -     | ND  |

Notes :

- (1) PFOA and its salts\* including PFOA (CAS No. 335-67-1), APFO (CAS No. 3825-26-1), PFOA-Na (CAS No. 335-95-5), PFOA-K (CAS No. 2395-00-8), PFOA-Ag (CAS No. 335-93-3) and PFOA-F (CAS No. 335-66-0). The result of PFOA is used to represent PFOA and its salts.
  - (2) PFOS and its salts\* including PFOS (CAS No. 1763-23-1), POSF(CAS No. 307-35-7), PFOS-K (CAS No. 2795-39-3), PFOS-NH<sub>4</sub> (CAS No. 29081-56-9), PFOS-N(C<sub>10</sub>H<sub>21</sub>)<sub>2</sub>(CH<sub>3</sub>)<sub>2</sub> (CAS No. 251099-16-8), PFOS-NH<sub>2</sub>(C<sub>2</sub>H<sub>4</sub>OH)<sub>2</sub> (CAS No. 70225-14-8), PFOS-Li (CAS No. 29457-72-5), PFOS-N(C<sub>2</sub>H<sub>5</sub>)<sub>4</sub> (CAS No. 56773-42-3) and PFOS-Na (CAS No. 4021-47-0). The result of PFOS is used to represent PFOS and its salts.
  - (3) Perfluorooctane sulfonates (PFOS) is/are accredited by CNAS.
- Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (w=0) stated in ILAC-G8:09/2019.



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REMARK :

LEPB12-37, LEPBZ12-37, LE25-43, LEZ25-43, LEPB19-43, LEPB19-43-1, LEPBZ19-43, LEPBZ19-43-1, LEPB19-43GZ, LEPBZ19-43GZ, LEPB43-105A, LEPB43-D, LEPB37-H, LEPBZ37-H, LEPB43-H, LEPBZ43-H, LEPB25-55, LEPB25-50, LEPBZ25-50, LEPBZ25-55, LE32-60, LEZ32-60, LEH32-60, LEPB32-60, LEPBZ32-60, LEPB25-60, LEPBZ25-60, LEPB86-105, LE60-H, LEZ60-H, LEPB60-H, LEPBZ60-H, LEPBH60-H, LEPBHZ60-H, LEPB70-H, LEPBZ70-H, LEPB80-H, LEPBZ80-H, LEPB100-H, LEPBZ100-H, LEPB60-F, LEPB25-65, LEPBZ25-65, LEPB25-70, LEPBZ25-70, LEPB32-80, LEPBZ32-80, LEPB50-80, LEPB50-100, LEPBZ50-100, LEPB37-105, LEPBZ37-105, LEPB37-105LE, LEPBZ37-105LE, LE37-105, LEZ37-105, LE37-105-L, LE43-105, LEZ43-105, LEPB43-105, LEPBZ43-105, LEPB43-105LE, LEPBZ43-105LE, LEPBH43-105LE, LEPBZ43-105A, LEPB50-105, LEPBZ50-105, LEPB80-105, LEPB80-105B, LEPBZ80-105, LEPB70-105B, LEPBZ70-105B, LE60-105, LEZ60-105, LEPB60-105, LEPBZ60-105, LEPB63-105, LEPBZ63-105, LEPB60-105LE, LEPBZ60-105LE, LEPB50-80LC, LEPB60-105A, LEPBZ60-105A, LEPB60-105B, LEPBZ60-105B, LEPB60-D-105, LEPB65-105, LEPBZ65-105, LEPB75-105, LEPBZ75-105, LEPB100-105, LEPB100-105LE, LEPBZ100-105, LEPB100-105A, LEPBZ100-105A, LEPB100-105B, LEPBZ100-105B, LEPB100-105YX, LEPBZ100-105YX, LEPB100-105YX -01, LEPBZ100-105YX-01 LEPBH15-37, LEPBHZ15-37, LEPBH19-43, LEPBHZ19-43, LEPBH25-60, LEPBHZ25-60, LEH60-105, LEHZ60-105, LEPBH25-65, LEPBHZ25-65, LEPBH25-70, LEPBHZ25-70, LEPBH32-80, LEPBHZ32-80, LEPBH50-80, LEPBHZ50-80, LEPBH50-100, LEPBH43-105, LEPBHZ43-105, LEPBH60-105, LEPBHZ60-105, LEPBH60-105LE, LEPBHZ60-105LE, LEPBH65-105, LEPBHZ65-105, LEPBH70-105, LEPBHZ70-105, LEPBH80-105, LEPBHZ80-105, LEPBH100-105, LEPBH100-105LE, LEPBHZ100-105, LEPBH60-105A, LEPBHZ60-105A, LEPBH43-105, LEPBH60-105, LEPBZ19-43MT, LEZ32-60-105, LE32-60-105, LEPB55-105, LEPB19-43 XXS, LEPBZ19-43XXS, LEPBH19-43XXS, LEPBHZ19-43XXS, LEPB25-60VA, LEPBZ25-60VA, LEPB12-37VA, LEPBZ12-37VA, LEPB25-50VA,



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LEPBZ25-50VA, LEPB37-K, LEPBZ37-K, LEPB43-K, LEPBZ43-K, LEPB55-K, LEPBZ55-K, LEPB60-K, LEPBZ60-K, LEPB50-80-K, LEPBZ50-80-K, LEPB70-K, LEPBZ70-K, LEPB80-K, LEPBZ80-K, LEPB100-K, LEPBZ100-K, LEPB150-K, LEPBZ150-K, SRJMB50-25-01, SRJMB50-25-02, LEPB63-HL, LEPBZ63-HL, LEPB60-HL, LEPBZ60-HL, LEPB63-H-HL, LEPBZ63-H-HL, LEPB120-105, LEPB25-43, LEPBZ25-43, LEPB37-J, LEPBZ37-J, LEPB43-J, LEPBZ43-J, LEPB55-J, LEPBZ55-J, LEPB60-J, LEPBZ60-J, LEPB70-J, LEPBZ70-J, LEPB80-J, LEPBZ80-J, LEPB100-J, LEPBZ100-J, LEPB150-J, LEPBZ150-J, LEPB25-70VA, LEPBZ25-70VA, LEPBHZ25-70VA, LEPBH25-70VA, LEPB19-37, LEPBZ19-37, LEPB30-60, LEPBZ30-60, LEPBHR85-105A, LEPB2101, LEPB2102, LEPB2103, LEPB2104, LEPB2105, LEPB2106, LEPB2107, LEPB2108, LEPB2109, LEPB2110, LEPB2111, LEPB2112, LEPB2113, LEPB2114, LEPB2115, LEPB2116, LEPB2117, LEPB2118, LEPB2119, LEPB2120, LEPB60-105D, LEPB70-105D, LEPB75-105D, LEPB43-105LE-P, LEPBZ43-105LE-P, LEPB60-105LE-P, LEPBZ60-105LE-P, LEPB50-40, LEPBZ60-HM-01, LEPB60-HM-01, LEPB19-43HM-01, LEPBZ19-43HM-01, LEPB63-105-HB-01, LEPBZ63-105-HB-01

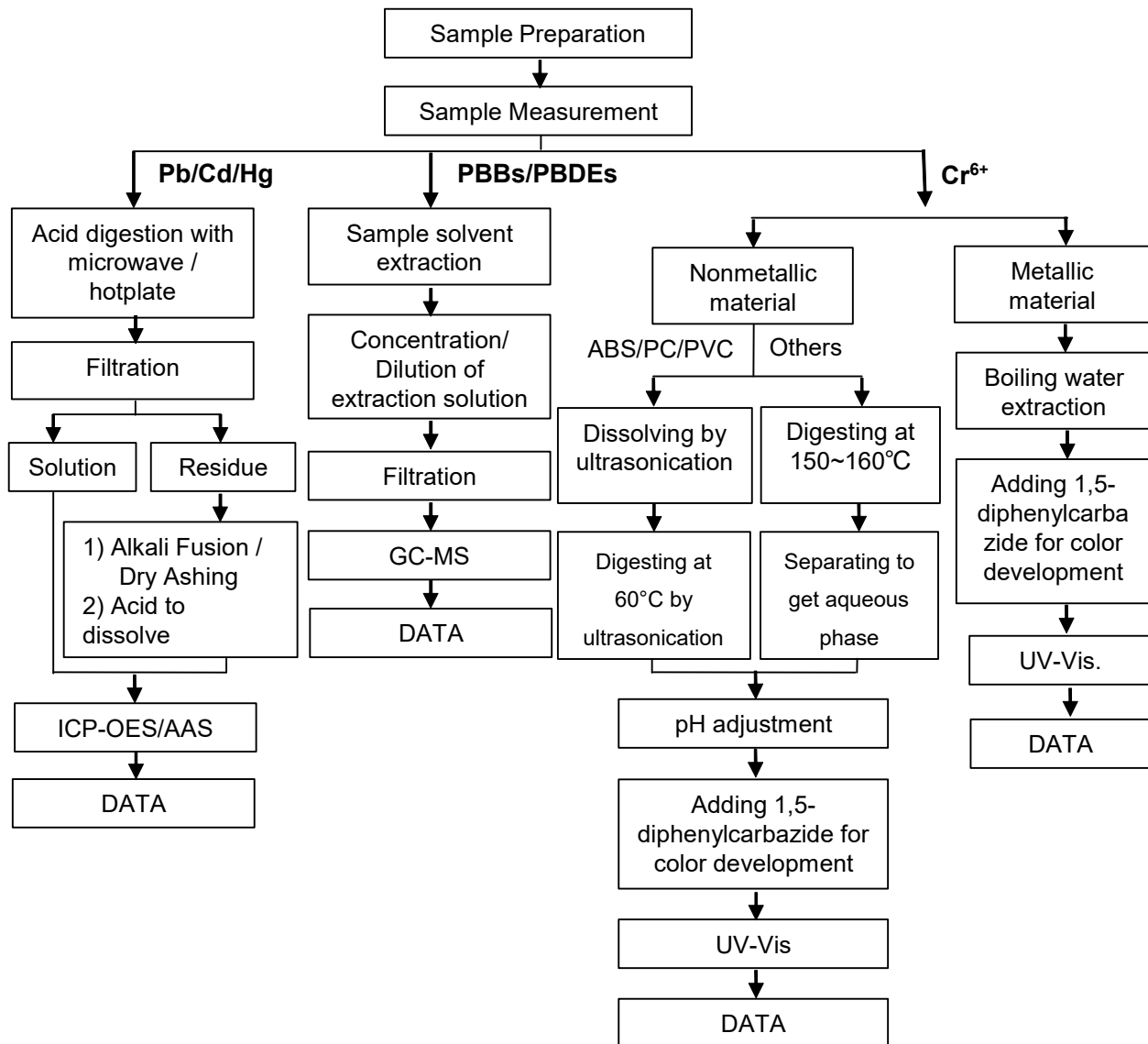


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Pb/Cd/Hg/Cr<sup>6+</sup>/PBBs/PBDEs Testing Flow Chart

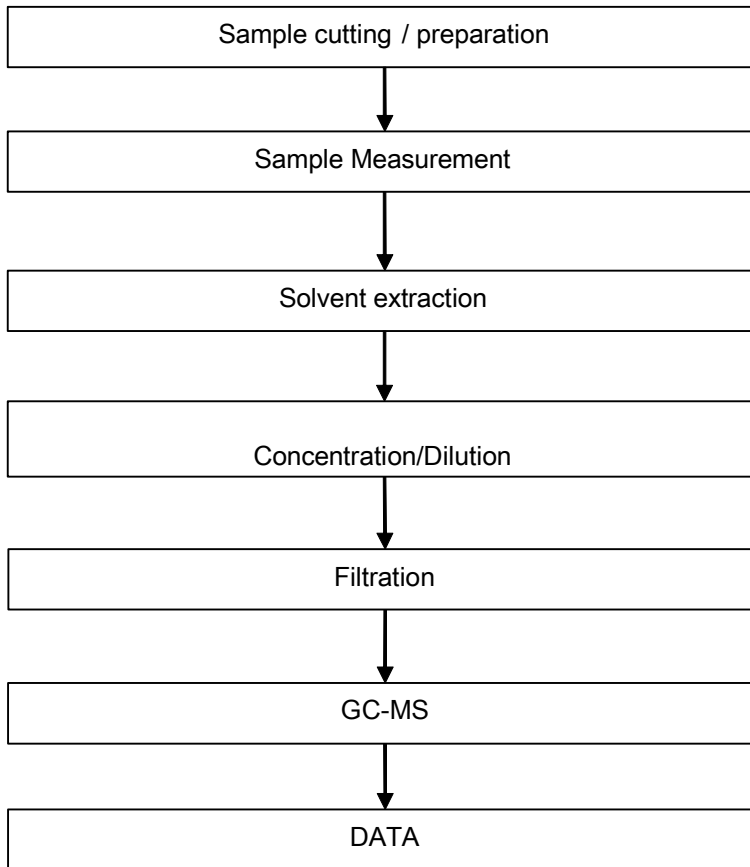
1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr<sup>6+</sup> and PBBs/PBDEs test method excluded).



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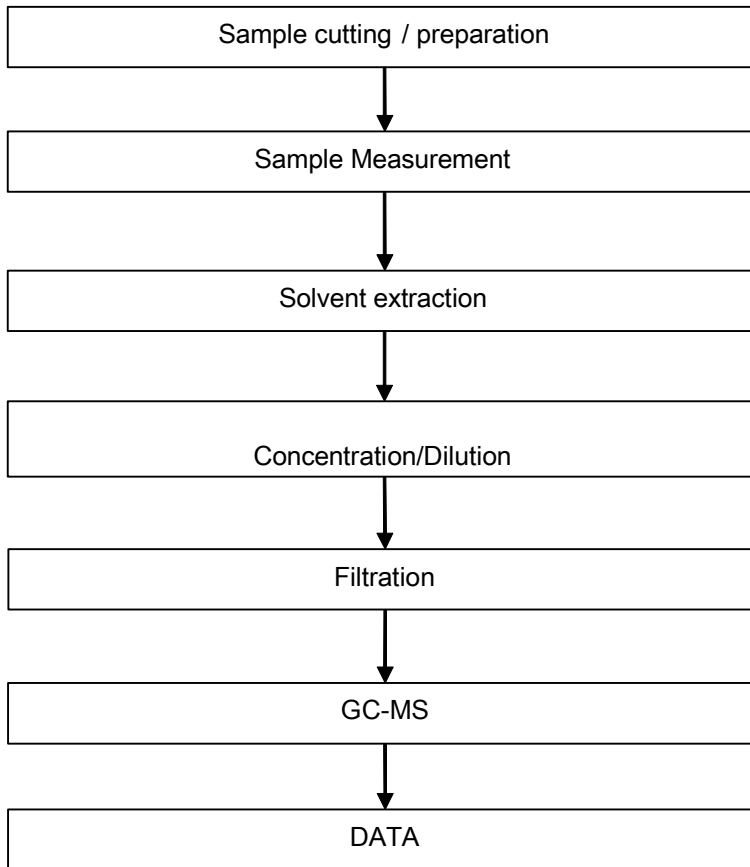
Phthalates Testing Flow Chart



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PAHs Testing Flow Chart

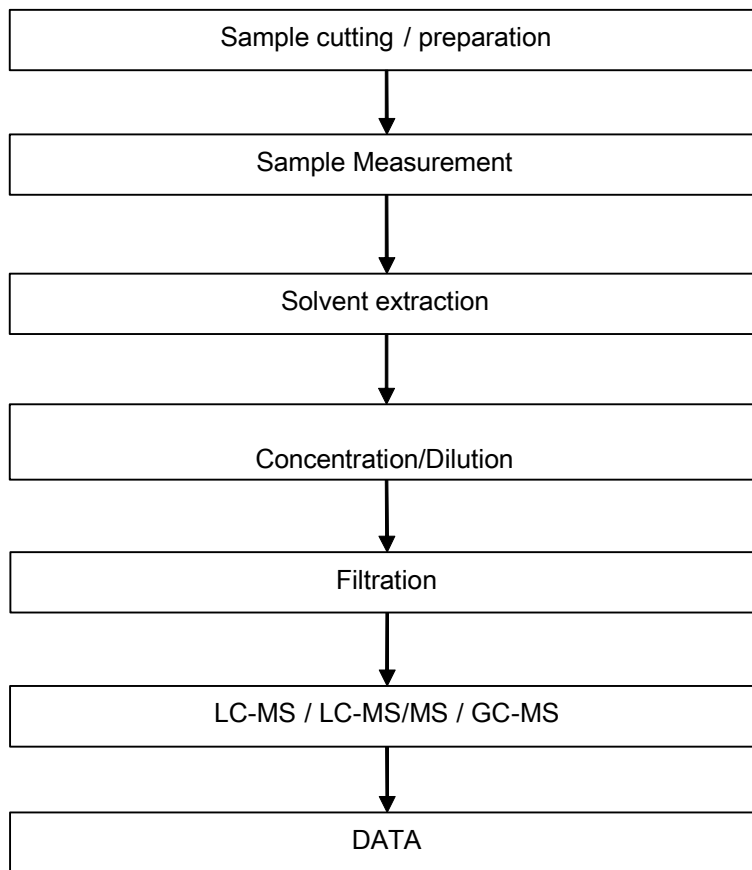


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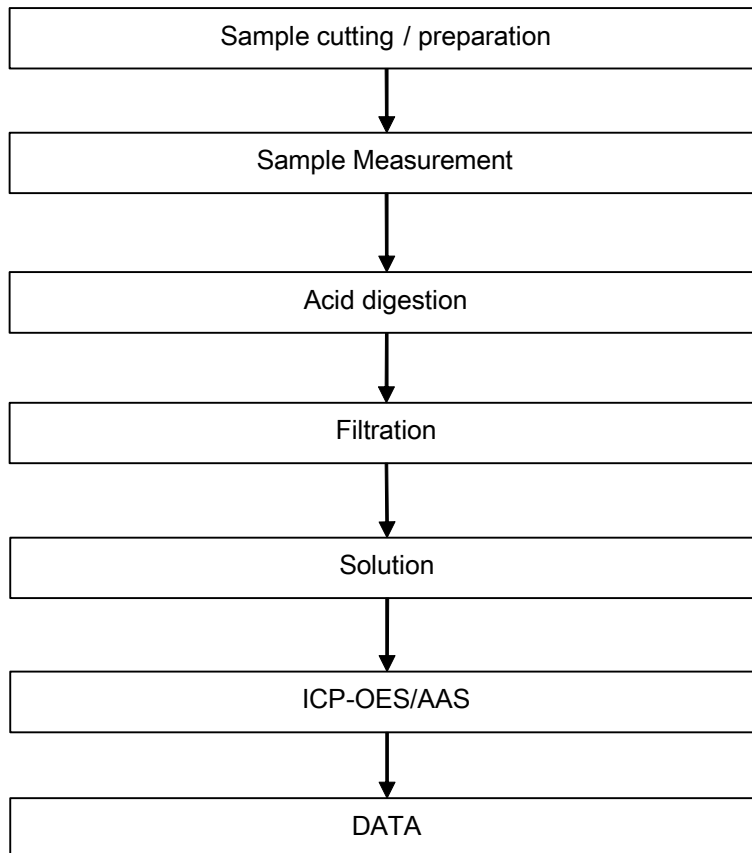
PFAS Testing Flow Chart



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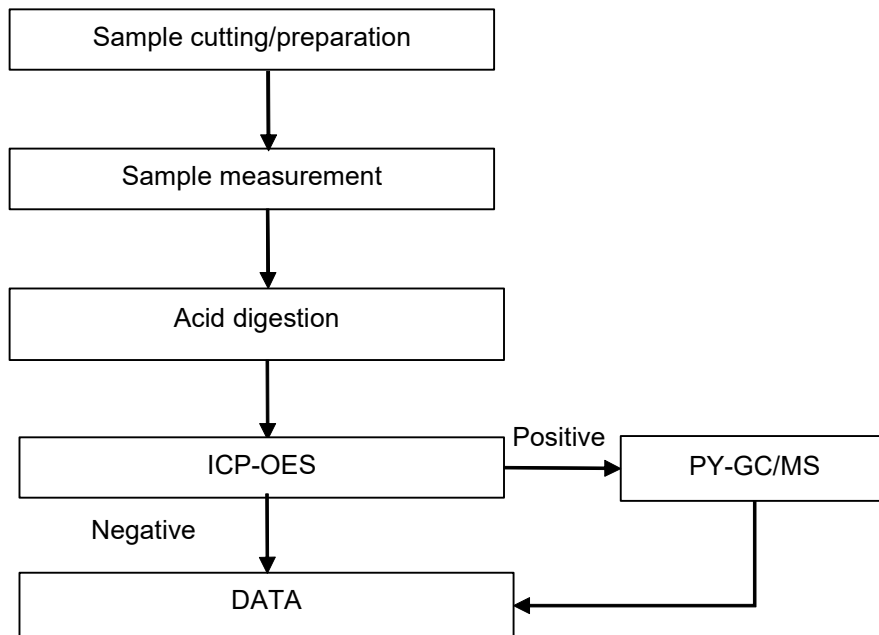
Elementary Testing Flow Chart



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Red phosphorus Testing Flow Chart



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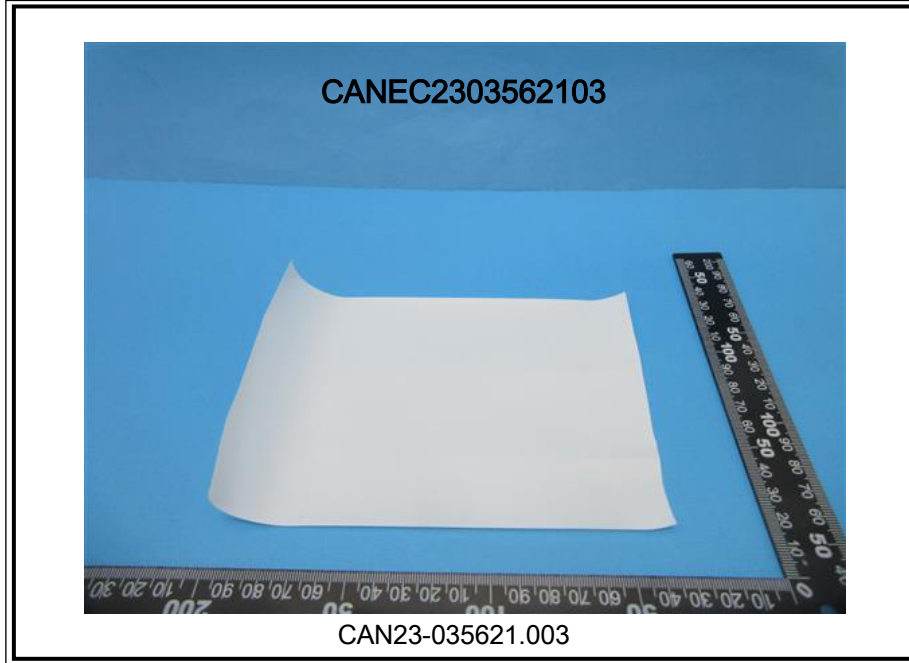
## Test Report

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Sample photo:



SGS authenticate the photo on original report only

\*\*\* End of Report \*\*\*



# Test Report

No. CANEC2307182507

Date: 27 May 2023

Page 1 of 19

Client Name : GUANGDONG LEARY NEW MATERIAL TECHNOLOGY CO.,LTD

Client Address : BEISHUI INDUSTRIAL ZONE, XINGTAN TOWN, SHUNDE DISTRICT, FOSHAN CITY, GUANGDONG PROVINCE.

Sample Name : Halogen free reinforcement plate

Model No. : LEB188-225S

Client Ref. Info. : SEE REMARK

The above sample(s) and information were provided by the client.

SGS Job No. : GZP23-002253 - GZ

Date of Sample Received : 19 May 2023

Testing Period : 19 May 2023 - 26 May 2023

Test Requested : Selected test(s) as requested by the client.

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

Test Result(s) : Please refer to next page(s).

## Result Summary :

| Test Requested   | Conclusion  |
|--|-------------|
| EU RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU- Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP) | PASS        |
| Halogen  | See Results |
| Elementary Analysis  | See Results |
| VOC  | See Results |
| Red Phosphor   | See Results |
| AfPS GS 2019:01 PAK - Polycyclic Aromatic Hydrocarbons (PAHs)  | See Results |
| Perfluorooctanoic acid (PFOA) and its salts & Perfluorooctane sulfonates (PFOS) and its derivatives  | See Results |
| Phthalate  | See Results |



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## Test Report

No. CANEC2307182507

Date: 27 May 2023

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



Zm guan  
Approved Signatory

scan to see the report



695C25CD



# Test Report

No. CANEC2307182507

Date: 27 May 2023

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Test Result(s) :

Test Part Description :

| Specimen No. | SGS Sample ID    | Description |
|--------------|------------------|-------------|
| SN1          | CAN23-071825.001 | Blue sheet  |

Remarks :

- (1) 1 mg/kg = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected ( < MDL )
- (4) "-" = Not Regulated

**EU RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU- Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP)**

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 | 001 |
|----------------------------|-------|-------|-----|-----|
| Cadmium (Cd)               | 100   | mg/kg | 2   | ND  |
| Lead (Pb)                  | 1000  | mg/kg | 2   | ND  |
| Mercury (Hg)               | 1000  | mg/kg | 2   | ND  |
| Hexavalent Chromium (CrVI) | 1000  | mg/kg | 8   | ND  |
| Sum of PBBs                | 1000  | 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               | 1000  | 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  |

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| <u>Test Item(s)</u>                 | <u>Limit</u> | <u>Unit</u> | <u>MDL</u> | <u>001</u> |
|-------------------------------------|--------------|-------------|------------|------------|
| 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)             | 1000         | mg/kg       | 50         | ND         |
| Butyl benzyl phthalate (BBP)        | 1000         | mg/kg       | 50         | ND         |
| Bis (2-ethylhexyl) phthalate (DEHP) | 1000         | mg/kg       | 50         | ND         |
| Diisobutyl Phthalates (DIBP)        | 1000         | mg/kg       | 50         | ND         |

### Notes :

- (1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
- (2) IEC 62321 series is equivalent to EN 62321 series
- (3) The restriction of DEHP, BBP, DBP and DIBP shall apply to medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, from 22 July 2021.

### Halogen

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

| <u>Test Item(s)</u> | <u>Unit</u> | <u>MDL</u> | <u>001</u> |
|---------------------|-------------|------------|------------|
| Fluorine (F)        | mg/kg       | 20         | 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 EPA 3052:1996), analysis was performed by ICP-OES.

| <u>Test Item(s)</u> | <u>Unit</u> | <u>MDL</u> | <u>001</u> |
|---------------------|-------------|------------|------------|
| Beryllium (Be)      | mg/kg       | 5          | ND         |
| Cobalt (Co)         | mg/kg       | 5          | ND         |



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### Notes :

- (1) Methods is/are not accredited by CNAS.

### VOC

Test Method : With reference to SGS in-house method (GZTC CHEM-TOP-050-37), TVOC test is performed according to Samsung requirement (2020):

TVOC analysis was performed by TVOC portable detector.

Benzene, Toluene and Phosphine analysis were performed by gas detecting tubes.

| <u>Test Item(s)</u> | <u>Unit</u> | <u>MDL</u> | <u>001</u>         |
|---------------------|-------------|------------|--------------------|
| Sample amount       | -           | -          | 900cm <sup>2</sup> |
| TVOC                | ppmV        | 16         | ND                 |
| Benzene             | ppmV        | 0.8        | ND                 |
| Toluene             | ppmV        | 16         | ND                 |
| Phosphine           | ppmV        | 0.08       | ND                 |

### Notes :

1. ppmV: Part per million by volume
2. Tedlar bag: 5L
3. Test condition: 40 °C, 30min
4. Methods is/are not accredited by CNAS.

### Red Phosphor

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

| <u>Test Item(s)</u> | <u>Unit</u> | <u>MDL</u> | <u>001</u> |
|---------------------|-------------|------------|------------|
| Red phosphorus      | mg/kg       | 500        | ND         |

### Notes :

- (1) Methods is/are not accredited by CNAS.

### AfPS GS 2019:01 PAK - Polycyclic Aromatic Hydrocarbons (PAHs)

Test Method : With reference to AfPS GS 2019:01 PAK, analysis was performed by GC-MS.

| <u>Test Item(s)</u> | <u>CAS NO.</u> | <u>Unit</u> | <u>MDL</u> | <u>001</u> |
|---------------------|----------------|-------------|------------|------------|
| Naphthalene(NAP)    | 91-20-3        | mg/kg       | 0.1        | ND         |
| Phenanthrene(PHE)   | 85-01-8        | mg/kg       | 0.1        | ND         |



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| <u>Test Item(s)</u>  | <u>CAS NO.</u> | <u>Unit</u> | <u>MDL</u> | <u>001</u> |
|--|----------------|-------------|------------|------------|
| 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         |
| Sum of 4 PAHs (Phenanthrene, Pyrene, Anthracene, Fluoranthene) | -              | mg/kg       | -          | ND         |
| Sum of 15 PAHs   | -              | mg/kg       | -          | ND         |



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AfPS ( German commission for Product Safety ) : PAHs requirements

| Parameter<br>(mg/kg)   | Category 1   | Category 2   |                               | Category 3  |                               |
|--|--|--|-------------------------------|---|-------------------------------|
|  | Materials intended to be placed in the mouth, or materials coming into long-term contact with skin (more than 30s) during the intended use<br><br>-in toys according to Directive 2009/48/EC<br>or -for the use by children <sup>a,b</sup> up to 3 years of age. | Materials not covered by category 1, coming into long-term contact (more than 30s) or short-term repetitive contact <sup>c</sup> with skin during the intended or foreseeable use <sup>d</sup> . |                               | Materials covered neither by category 1 nor by category 2, coming into short-term contact (up to 30s) with skin during the intended or foreseeable use. |                               |
|  |  | a.<br>use by children  | b.<br>other consumer products | a.<br>use by children   | b.<br>other consumer products |
| Benzo(a)pyrene (BaP)   | < 0.2  | < 0.2  | < 0.5                         | < 0.5   | < 1                           |
| Benzo(e)pyrene (BeP)   | < 0.2  | < 0.2  | < 0.5                         | < 0.5   | < 1                           |
| Benzo(a)anthracene (BaA)   | < 0.2  | < 0.2  | < 0.5                         | < 0.5   | < 1                           |
| Benzo(b)fluoranthene (BbF)   | < 0.2  | < 0.2  | < 0.5                         | < 0.5   | < 1                           |
| Benzo(j)fluoranthene (BjF)   | < 0.2  | < 0.2  | < 0.5                         | < 0.5   | < 1                           |
| Benzo(k)fluoranthene (BkF)   | < 0.2  | < 0.2  | < 0.5                         | < 0.5   | < 1                           |
| Chrysene (CHR)   | < 0.2  | < 0.2  | < 0.5                         | < 0.5   | < 1                           |
| Dibenzo(a,h)anthracene (DBA)   | < 0.2  | < 0.2  | < 0.5                         | < 0.5   | < 1                           |
| Benzo(g,h,i)perylene (BPE)   | < 0.2  | < 0.2  | < 0.5                         | < 0.5   | < 1                           |
| Indeno(1,2,3-cd)pyrene (IPY)   | < 0.2  | < 0.2  | < 0.5                         | < 0.5   | < 1                           |
| Phenanthrene (PHE), pyrene (PYR), anthracene (ANT), fluoranthene (FLT) | < 1 Sum  | < 5 Sum  | < 10 Sum                      | < 20 Sum  | < 50 Sum                      |
| Naphthalene (NAP)  | < 1  | < 2  |                               | < 10  |                               |
| <b>Sum of 15 PAHs</b>  | <1   | < 5  | < 10                          | < 20  | < 50                          |

Note:

<sup>a</sup> A "Child" is legally defined as a person before reaching the age of 14 years.

<sup>b</sup> Use by children includes both active and passive contact by children.

<sup>c</sup> Definition "short-term repetitive contact" taken from REACH Annex XVII entry 50 amendment (Regulation (EC) No. 1272/2013)

<sup>d</sup> According to the definition of the German Product Safety Act (ProdSG) (chapter 1 Article 2 No. 28) "foreseeable use" shall mean the use of a product in a manner that the person placing it on the market, has not intended, but which could be reasonably foreseeable.

**Remark:** The German committee on Product Safety (AfPS) published a new PAHs document (AfPS GS 2019:01 PAK) on April 10, 2020, which will be binding for the issue of GS mark certificate from July 1, 2020.

**Perfluorooctanoic acid (PFOA) and its salts & Perfluorooctane sulfonates (PFOS) and its derivatives**

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



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| Test Item(s)  | CAS NO.    | Unit  | MDL   | 001 |
|---|------------|-------|-------|-----|
| Perfluorooctanoic acid (PFOA) and its salts*                    | -          | mg/kg | 0.010 | ND  |
| Perfluorooctane sulfonates (PFOS) and its salts*                | -          | mg/kg | 0.010 | ND  |
| Perfluorooctane Sulfonamide (PFOSA)                             | 754-91-6   | mg/kg | 0.010 | ND  |
| N-methylperfluoro-1-octanesulfonamide(N-MeFOSA)                 | 31506-32-8 | mg/kg | 0.010 | ND  |
| N-ethylperfluoro-1-octanesulfonamide (N-EtFOSA)                 | 4151-50-2  | mg/kg | 0.010 | ND  |
| 2-(N-methylperfluoro-1-octanesulfonamido)<br>-ethanol(N-MeFOSE) | 24448-09-7 | mg/kg | 0.010 | ND  |
| 2-(N-ethylperfluoro-1-octanesulfonamido)<br>-ethanol(N-EtFOSE)  | 1691-99-2  | mg/kg | 0.010 | ND  |
| Perfluorooctane sulfonates (PFOS) and its<br>derivatives        | -          | mg/kg | -     | ND  |

### Notes :

- (1) PFOA and its salts\* including PFOA (CAS No. 335-67-1), APFO (CAS No. 3825-26-1), PFOA-Na (CAS No. 335-95-5), PFOA-K (CAS No. 2395-00-8), PFOA-Ag (CAS No. 335-93-3) and PFOA-F (CAS No. 335-66-0). The result of PFOA is used to represent PFOA and its salts.
- (2) PFOS and its salts\* including PFOS (CAS No. 1763-23-1), POSF(CAS No. 307-35-7), PFOS-K (CAS No. 2795-39-3), PFOS-NH<sub>4</sub> (CAS No. 29081-56-9), PFOS-N(C<sub>10</sub>H<sub>21</sub>)<sub>2</sub>(CH<sub>3</sub>)<sub>2</sub> (CAS No. 251099-16-8), PFOS-NH<sub>2</sub>(C<sub>2</sub>H<sub>4</sub>OH)<sub>2</sub> (CAS No. 70225-14-8), PFOS-Li (CAS No. 29457-72-5), PFOS-N(C<sub>2</sub>H<sub>5</sub>)<sub>4</sub> (CAS No. 56773-42-3) and PFOS-Na (CAS No. 4021-47-0). The result of PFOS is used to represent PFOS and its salts.
- (3) Perfluorooctane sulfonates (PFOS) is/are accredited by CNAS.

### 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  |
| Bis(2-ethylhexyl) Phthalate (DEHP)   | 117-81-7                   | %(w/w) | 0.003 | ND  |
| Benzylbutyl Phthalate (BBP)          | 85-68-7                    | %(w/w) | 0.003 | ND  |
| Di-n-octyl Phthalate (DNOP)          | 117-84-0                   | %(w/w) | 0.003 | ND  |
| Diisononyl Phthalate (DINP)          | 28553-12-0 /<br>68515-48-0 | %(w/w) | 0.010 | ND  |
| Diisodecyl Phthalate (DIDP)          | 26761-40-0 /<br>68515-49-1 | %(w/w) | 0.010 | ND  |
| Di-n-hexyl Phthalate (DnHP)          | 84-75-3                    | %(w/w) | 0.003 | ND  |
| Diisobutyl Phthalate (DIBP)          | 84-69-5                    | %(w/w) | 0.003 | ND  |
| Diisopentyl Phthalate (DIPP)         | 605-50-5                   | %(w/w) | 0.003 | ND  |
| Dipentyl Phthalates (DPENP/DnPP)     | 131-18-0                   | %(w/w) | 0.003 | ND  |
| n-pentyl Isopentyl Phthalate (nPIPP) | 776297-69-9                | %(w/w) | 0.003 | ND  |



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| Test Item(s)   | CAS NO.               | Unit   | MDL   | 001 |
|--|-----------------------|--------|-------|-----|
| 1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP)  | 68515-42-4            | %(w/w) | 0.010 | ND  |
| Bis(2-methoxyethyl) Phthalate (DMEP)   | 117-82-8              | %(w/w) | 0.003 | ND  |
| 1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)  | 71888-89-6            | %(w/w) | 0.010 | ND  |
| 1,2-Benzenedicarboxylic acid, dipentyl ester, branched and linear (DPP)  | 84777-06-0            | %(w/w) | 0.010 | ND  |
| Dicyclohexyl Phthalate (DCHP)  | 84-61-7               | %(w/w) | 0.003 | ND  |
| 1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with $\geq 0.3\%$ of dihexyl phthalate | 68515-51-5/68648-93-1 | %(w/w) | 0.010 | ND  |
| 1,2-Benzenedicarboxylic acid, dihexyl ester branched and linear (DHP)  | 68515-50-4            | %(w/w) | 0.010 | ND  |
| Di-iso-hexylphthalate (DIHxP)  | 71850-09-4            | %(w/w) | 0.010 | ND  |

### Notes :

(1) DBP, BBP, DEHP, DIBP Reference information: Entry 51 of Regulation (EU) 2018/2005 amending Annex XVII of REACH Regulation (EC) No 1907/2006:

i) Shall not be used as substances or in mixtures, individually or in any combination of DBP, BBP, DEHP & DIBP, in concentrations equal to or greater than 0.1 % by weight of the plasticised material, in toys and childcare articles.

ii) Shall not be placed on the market in toys or childcare articles, individually or in any combination of DBP, BBP, DEHP, in concentrations equal to or greater than 0.1 % by weight of the plasticised material. In addition, DIBP shall not be placed on the market after 7 July 2020 in toys or childcare articles, individually or in any combination of DBP, BBP, DEHP & DIBP, in concentrations equal to or greater than 0.1 % by weight of the plasticised material.

iii) shall not be placed on the market after 7 July 2020 in articles, individually or in any combination of DBP, BBP, DEHP & DIBP, in concentrations equal to or greater than 0.1 % by weight of the plasticised material in the articles.

Please refer to Regulation (EU) 2018/2005 to get more detail information

(2) DINP, DNOP, DIDP Reference information: Entry 52 of Regulation (EU) 2015/326 amending Annex XVII of REACH Regulation (EC) No 1907/2006.

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 (EU) 2015/326 to get more detail information

(3) Methods is/are not accredited by CNAS.

Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule ( $w=0$ ) stated in ILAC-G8:09/2019.



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REMARK :

LEB25-55ST, LEB25-55SW, LEB75-100S, LEBH100-130S, LEB100-130SW, LEB100-130AW, LEB100-130ST, LEB100-130SQ, LEB100-130S, LEB100-130A, LEB100-130ACZY , LEB125-160S, LEB125-160SQ, LEB125-160A, LEB125-160Y, LEB125-160SW, LEB125-160ST, LEB125-160AW, LEB125-160ACZY, LEB125-160YCZY, LEB150-183A, LEB150-183ACZY, LEB150-183S, LEB150-183SQ, LEB150-183SW, LEB150-183ST, LEB150-183AW, LEB150-183Y, LEB175-205S, LEB175-205Y, LEB175-205SQ, LEB175-205ST, LEB175-205A, LEB175-205AW, LEB175-205SW, LEB188-215S, LEB188-215ST, LEB188-215SQ, LEB188-215A, LEB188-218S, LEB188-218ST, LEB188-218SQ, LEB188-218SW, LEB188-225S, LEB188-225SY, LEB188-225SQ, LEB188-225ACZY, LEB188-225YCZY, LEB188-225YBZY, LEB188-225 SHF, LEB188-225SQBD, LEB188-225ASHF, LEB188-225SW, LEB188-225ST, LEB188-225AW, LEB188-225DGSHF-Y, LEB188-225A, LEB188-225GSHF-H, LEB188-225Y, LEB225-HF, LEB188-225AL, LEB215-250S, LEB215-250A, LEB215-250Y, LEB215-250ACZY, LEB215-250YCZY, LEB215-250YBZY, LEB220-260GSHF-H, LEB250-282S, LEB250-282Y, LEB250-282A, LEB250-282ACZY, LEB250-282YCZY, LEB250-282YBZY, LEB250-282SQ, LEB250-282GSZY, LEB250-290GSZY, LEB188-215SW, LEB100-130SZ, LEB125-160 SZ, LEB150-183 SZ, LEB175-205 SZ, LEB188-215SZ, LEB188-225 SZ, LEB215-250 SZ, LEB250-282 SZ, LEB188-218DQ, LEB175-205SH, LEB188-225SQBD, LEB125-160SPT, LEB188-225SPT, LEB188-240S, LEB250-282GSZY-04 , LEB250-282KTZY-05, LEB215-250KTZY-01, LEB188-218KTZY-01, LEB150-183KTZY-01, LEB150-190KTZY-01, LEB125-155KTZY-01, LEB188-225WKTZY-01, LEBAL-240S, LEB250-285KTZYS-01, LEB250-282GP, LEB215-250GP, LEB188-218GP, LEB150-183GP, LEB150-190GP, LEB125-155GP, LEB188-225GP, LEB25-55ST, LEB85-105S, LEB150-183SPT, LEB175-205SPT, LEB215-250SR, LEB215-250TSY, LEB188-235SW, LEB188-233SW, LEBF250Q, LEB250-295SQ, LEB75-100SW, LEB100-120S, LEB125-160SZ, LEB125-165S, LEB188-225SZ, LEB215-250SW, LEB50-85S, LEB100-130SL, LEB125-160SL, LEB150-183SL,



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## Test Report

No. CANEC2307182507

Date: 27 May 2023

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LEB175-205SL, LEB188-215SL, LEB188-218SL, LEB188-225SL, LEB250-282SL, LEB250-295SL,  
LEB100-130SR, LEB125-160SR, LEB150-183SR, LEB175-205SR, LEB188-215SR, LEB188-218SR,  
LEB188-225SR, LEB250-282SR, LEB250-295SR, LEB100-130SH, LEB125-160SH, LEB150-183SH,  
LEB175-205SH, LEB188-215SH, LEB188-218SH, LEB188-225SH, LEB250-282SH, LEB250-295SH,  
LEB188-233S, LEB188-233SQ, LEB188-233Y, LEB188-233ST, LEB188-233SZ, LEB188-233A, LEB188-233SL,  
LEB100-130S-D, LEB125-160S-D, LEB150-183S-D, LEB175-205S-D, LEB188-225S-D, LEB215-250S-D,  
LEB250-282S-D, LEBAL-240, LEBAL-230S, LEBAL-205S, LEBAL202S, LEBAL-225S, LEBA-225, LEBA-100,  
LEBA-100-HH, LEBA-205, LEBA-205-HH, LEBA-230, LEBA-230-HH, LEB140-AL, LEB50-100ST, LEB75-100ST,  
LEB215-250ST, LEB250-282ST, LEB25-65KTZY

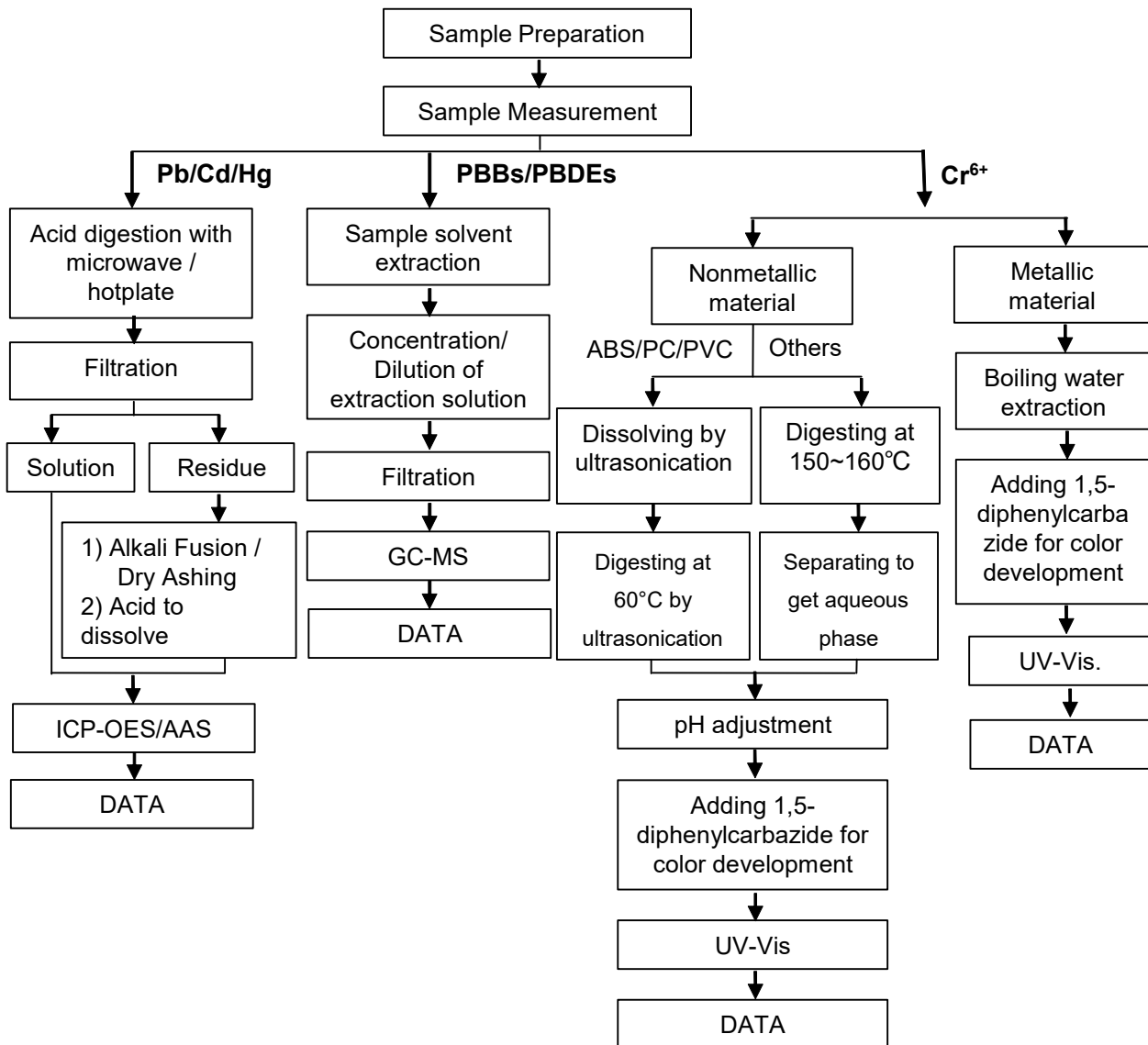


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**Pb/Cd/Hg/Cr<sup>6+</sup>/PBBs/PBDEs Testing Flow Chart**

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

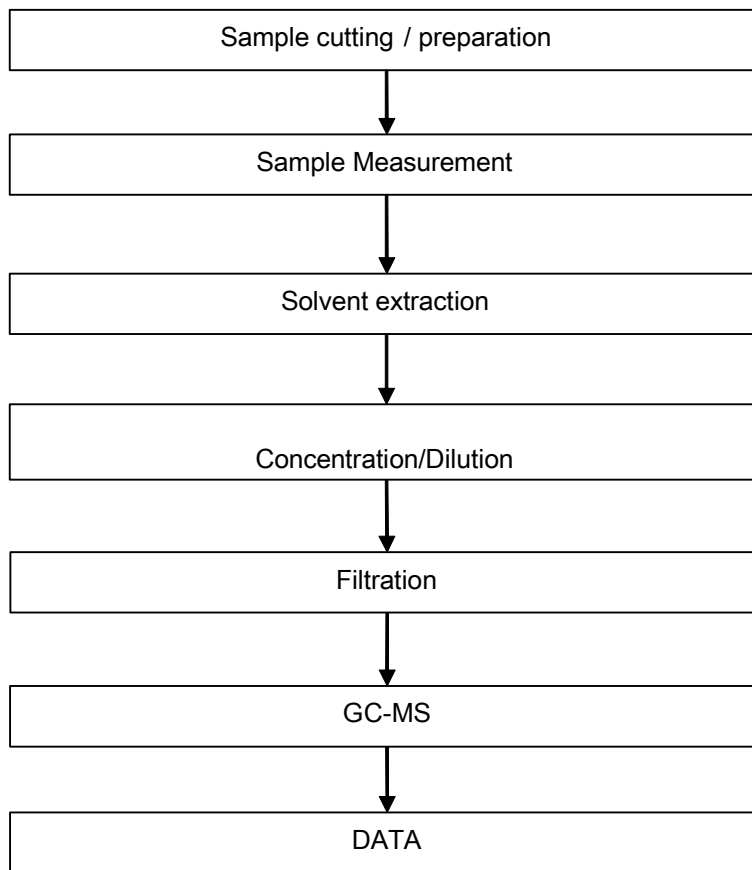


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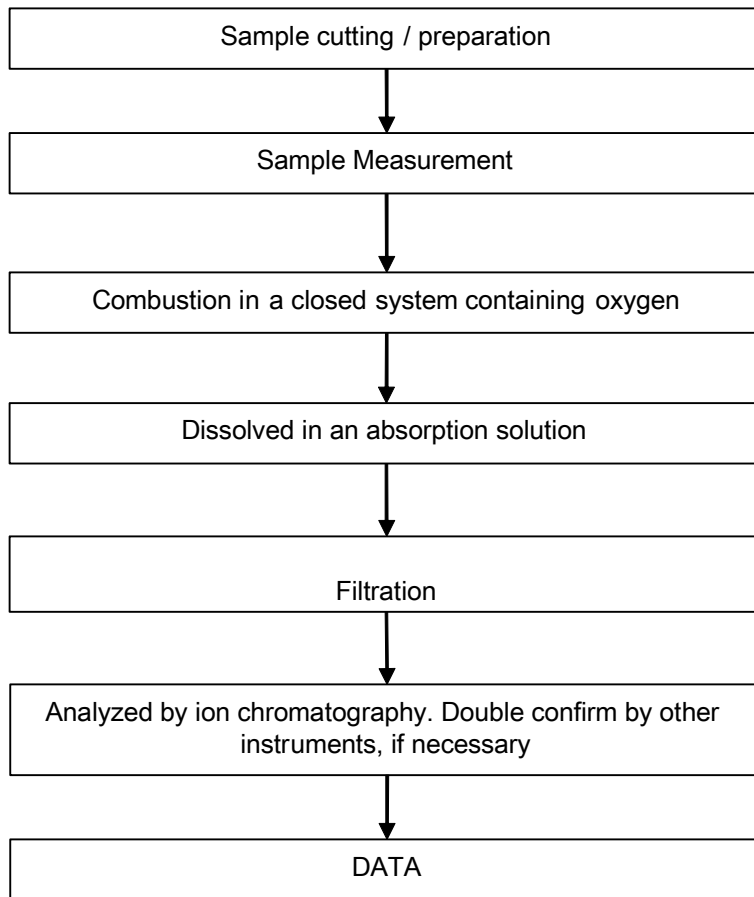
Phthalates Testing Flow Chart



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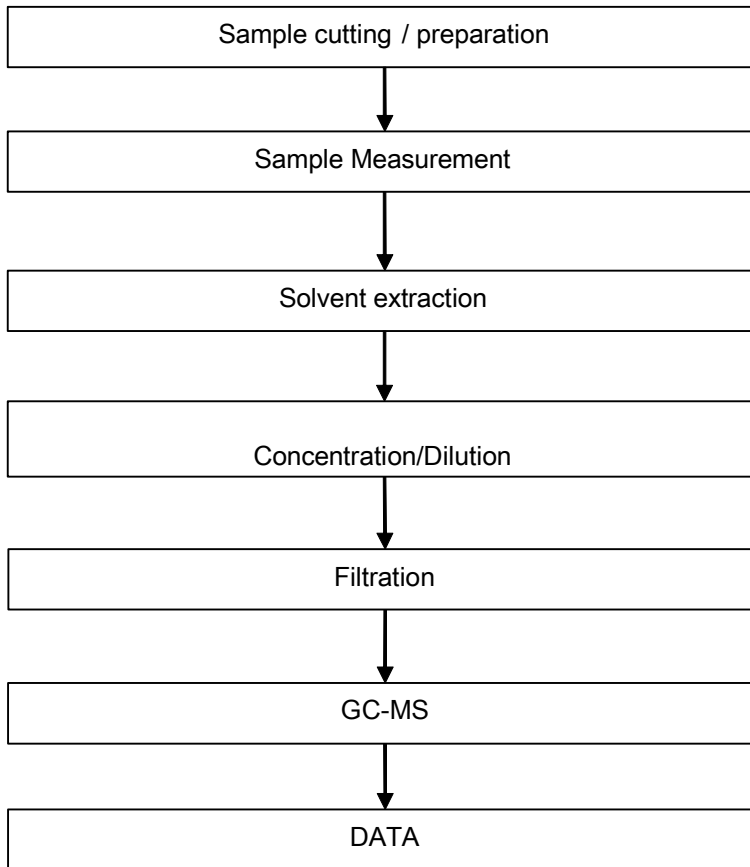
Halogen Testing Flow Chart



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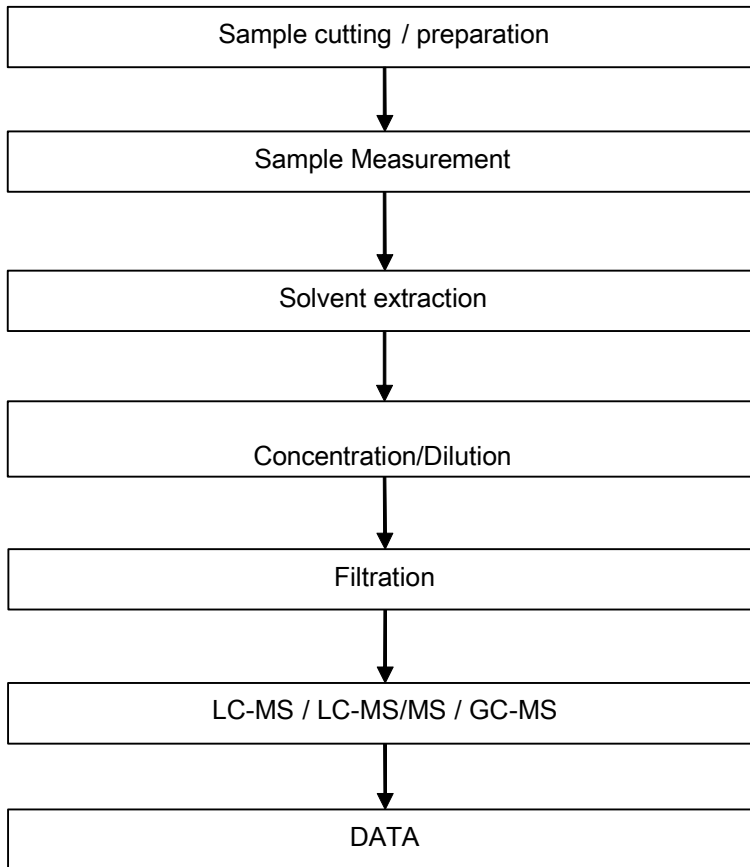
PAHs Testing Flow Chart



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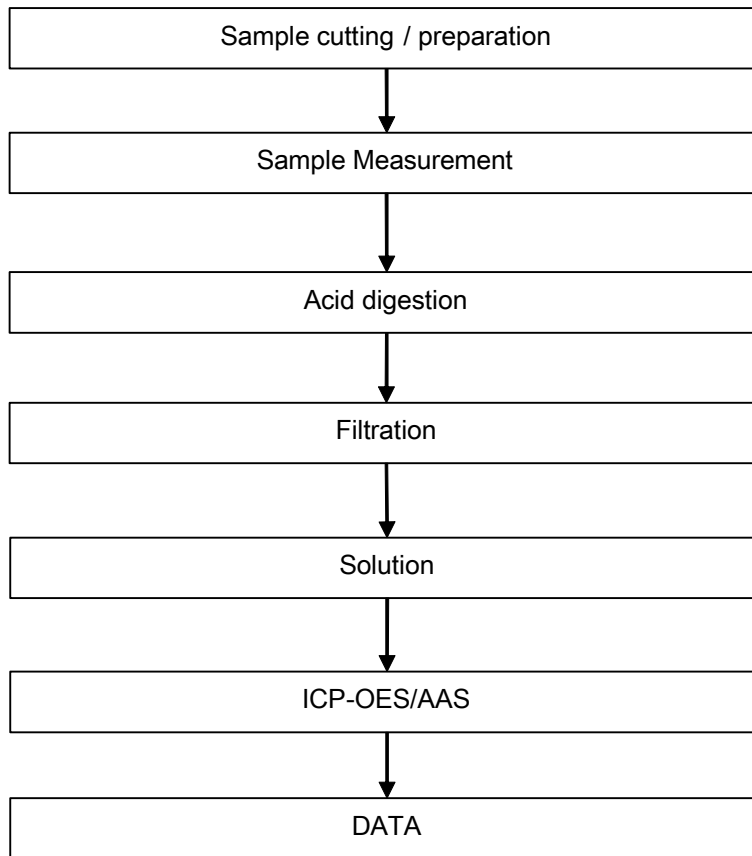
PFAS Testing Flow Chart



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Elementary Testing Flow Chart

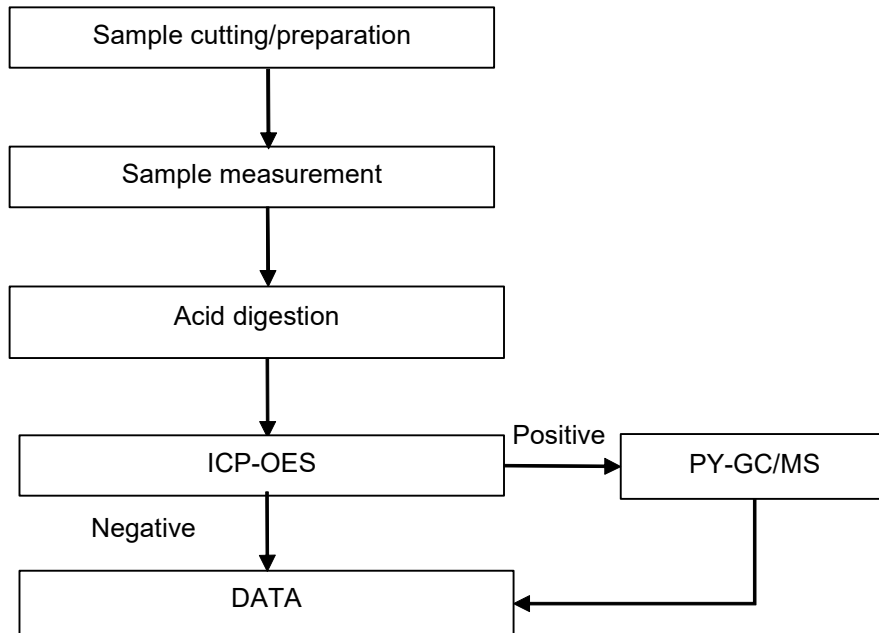


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Red phosphorus Testing Flow Chart



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## Test Report

No. CANEC2307182507

Date: 27 May 2023

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Sample photo:



SGS authenticate the photo on original report only

\*\*\* End of Report \*\*\*





# 东莞市华冠电线制品有限公司

## 物质成份安全资料表 (MSDS)

### 一、物品与厂商资料

|                           |
|---------------------------|
| 物品名称： 镀锡铜线                |
| 物品编号：                     |
| 制 造商或供应商名称： 深圳市暹营电子科技有限公司 |

### 二、成份辩试资料

|  |
|--|
| 成份： 铜  |
| 同义同称：  |
| 化学文摘社登记号码 (CAS NO):铜： 7440-50-8, 锡 CAS No: 7440-31-5 |
| 危害物质成分 (成分百分比) 铜： 99.96% , 锡 :0.04%                  |

### 三、危害辩识资料：

|                                 |  |
|---------------------------------|--|
| 最<br>重<br>要<br>危<br>害<br>效<br>应 | 健康危害效应： 铜危害很小。                                       |
|                                 | 环境影响： 环保产品 ， 低铅低镉 (Pb<5PPm Cd<5PPm Cr<2PPmm Hg<2PPm) |
|                                 | 物理性及化学性危害：锐利可划伤皮肤。                                   |
|                                 | 特殊危害： 无  |
| 主要症状： 误食 400g 以上出现呕吐，胸闷         |  |

### 四、急救措施

|                                  |
|----------------------------------|
| 不 同暴露途径之急救方法                     |
| ●食入、吸入： 吸入就医，食入 400g 以上铜出现呕吐、胸闷。 |
| ●皮肤接触： 用水清洗 5 分钟以上。              |
| ●眼睛接触： 有刺痛送医院治疗。                 |
| 最重要危害效应：食入 400g 以上出现呕吐、胸闷        |
| 对急救人员之防护： 无                      |
| 对 医师之提示： 尽可能清楚告之感染物，节省救治时效。      |

### 五、灭火措施

|                      |
|----------------------|
| 适用灭火剂： 干粉            |
| 灭火时可能遭遇之特殊危害： 无      |
| 特殊灭火程序： 无            |
| 消防人员之特殊防护设备： 应穿戴防护器具 |

### 六、泄漏处理方法

|                           |
|---------------------------|
| 线材为固体，不存在泄漏隐患。            |
| 环境注意事项： 不存放于高温，潮湿，酸碱物质一起。 |
| 清理方法： 回收、重熔               |

### 七、安全处置与储存方法

|                      |
|----------------------|
| 处置： 一般性回收重熔          |
| 储存： 避免高温环境及勿接触酸性强物质。 |

### 八、暴露预防措施

|                     |
|---------------------|
| 工程控制： 避免高温 ， 酸碱物质接触 |
| 生物指示：               |
| 个人防护设备：             |
| ●呼吸防护： 劳保口罩         |
| ●手部防护： 带手套          |
| ●眼睛防护： 防护眼镜         |

|                 |
|-----------------|
| ●皮肤及身体防护： 穿好工作服 |
| 卫生措施： 意外食入后及时就医 |

### 九、物理及化学性质

|                              |            |
|------------------------------|------------|
| 物质状态： 固体物                    | 形状： 线状     |
| 颜色： 铜： 玫瑰色                   | 沸点/沸点范围： 无 |
| PH 值： 中性                     | 气味： 无      |
| 自然温度： 无                      | 爆炸界限： 无    |
| 蒸气压力： 无                      | 蒸气密度： 无    |
| 密度： 铜： 8.89g/cm <sup>3</sup> | 溶解度： 难熔    |

### 十、安定性及反应性

|                         |
|-------------------------|
| 安定性： 常态下保持稳定            |
| 特殊状况下可能之危害反应： 高温状态下灼伤皮肤 |
| 应避免之状况： 避免食入            |
| 应避免之物质： 酸碱性物质           |

### 十一、毒性资料

|                            |
|----------------------------|
| 急毒性： 无                     |
| 慢性或长期性毒性： 体内积铜肝、 肾有害       |
| 特殊效应： 误食 400g 以上出现恶心、呕吐、胸闷 |

### 十二、生态资料

|               |
|---------------|
| 可能之环境影响/环境： 无 |
|---------------|

### 十三、废弃处置方法

|              |
|--------------|
| 废弃处理方法： 回收重熔 |
|--------------|

### 十四、运送资料

|                              |
|------------------------------|
| 特殊运送方法及注意事项： 线材应避免磕碰， 防雨， 防潮 |
|------------------------------|

### 十五、法规资料

适用法规： ROHS 指令

### 十六、其他资料

#### 参考文献

|      |                     |                   |
|------|---------------------|-------------------|
| 制表单位 | 东 莞市华冠电线制品有限公司      |                   |
|      | 地址： 东莞市常平镇苏坑一路 93 号 |                   |
|      | 电话： 0769-23094606   | 传真： 0769-27384939 |
| 制表人  | 龚兰兰                 |                   |

## 检测报告

编号: SZXEC2202743402

日期: 2022年08月17日 第1页,共6页

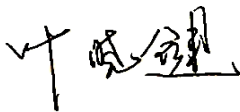
客户名称: 东莞市华冠电线制品有限公司  
 客户地址: 广东省东莞市常平镇苏坑一路93号7栋201室

样品名称: 镀锡铜线  
 以上样品及信息由客户提供。

SGS工作编号: RP22-021458 - SZ  
 样品接收日期: 2022年08月12日  
 检测周期: 2022年08月12日 - 2022年08月17日  
 检测要求: 根据客户要求检测  
 检测方法: 请参见下一页  
 检测结果: 请参见下一页  
 检测结果概要:

| 检测要求   | 结论 |
|--|----|
| 欧盟RoHS指令2011/65/EU附录II修正指令(EU) 2015/863- 铅,汞,镉,六价铬,多溴联苯(PBBs),多溴二苯醚(PBDEs),邻苯二甲酸二丁酯(DBP),邻苯二甲酸丁苄酯(BBP),邻苯二甲酸二(2-乙基己基)酯(DEHP)和邻苯二甲酸二异丁酯(DIBP) | 符合 |

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## 检测报告

编号: SZXEC2202743402

日期: 2022年08月17日 第2页,共6页

检测结果:

### 检测样品描述:

| 样品编号 | SGS样品ID          | 描述        |
|------|------------------|-----------|
| SN1  | SZX22-027434.001 | 带银色镀层的金属线 |

备注:

- (1) 1 mg/kg = 0.0001%
- (2) MDL = 方法检测限
- (3) ND = 未检出 (< MDL)
- (4) "-" = 未规定

### 欧盟RoHS指令2011/65/EU附录II修正指令(EU) 2015/863- 铅, 汞, 镉, 六价铬, 多溴联苯(PBBs), 多溴二苯醚(PBDEs), 邻苯二甲酸二丁酯 (DBP), 邻苯二甲酸丁苄酯(BBP), 邻苯二甲酸二(2-乙基己基)酯(DEHP)和邻苯二甲酸二异丁酯(DIBP)

检测方法: 参考IEC 62321-4:2013+AMD1:2017, IEC 62321-5:2013, IEC 62321-7-1:2015, IEC 62321-6:2015和IEC 62321-8:2017, 采用ICP-OES,UV-Vis和GC-MS进行分析.

| 检测项目           | 限值   | 单位                 | MDL  | 001 |
|----------------|------|--------------------|------|-----|
| 镉 (Cd)         | 100  | mg/kg              | 2    | ND  |
| 铅 (Pb)         | 1000 | mg/kg              | 2    | ND  |
| 汞 (Hg)         | 1000 | mg/kg              | 2    | ND  |
| 六价铬(Cr(VI))▼   | -    | µg/cm <sup>2</sup> | 0.10 | ND  |
| 多溴联苯之和(PBBs)   | 1000 | mg/kg              | -    | ND  |
| 一溴联苯           | -    | mg/kg              | 5    | ND  |
| 二溴联苯           | -    | mg/kg              | 5    | ND  |
| 三溴联苯           | -    | mg/kg              | 5    | ND  |
| 四溴联苯           | -    | mg/kg              | 5    | ND  |
| 五溴联苯           | -    | mg/kg              | 5    | ND  |
| 六溴联苯           | -    | mg/kg              | 5    | ND  |
| 七溴联苯           | -    | mg/kg              | 5    | ND  |
| 八溴联苯           | -    | mg/kg              | 5    | ND  |
| 九溴联苯           | -    | mg/kg              | 5    | ND  |
| 十溴联苯           | -    | mg/kg              | 5    | ND  |
| 多溴二苯醚之和(PBDEs) | 1000 | mg/kg              | -    | ND  |
| 一溴二苯醚          | -    | mg/kg              | 5    | ND  |
| 二溴二苯醚          | -    | mg/kg              | 5    | ND  |
| 三溴二苯醚          | -    | mg/kg              | 5    | ND  |
| 四溴二苯醚          | -    | mg/kg              | 5    | ND  |



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## 检测报告

编号: SZXEC2202743402

日期: 2022年08月17日 第3页,共6页

| 检测项目                   | 限值   | 单位    | MDL | 001 |
|------------------------|------|-------|-----|-----|
| 五溴二苯醚                  | -    | mg/kg | 5   | ND  |
| 六溴二苯醚                  | -    | mg/kg | 5   | ND  |
| 七溴二苯醚                  | -    | mg/kg | 5   | ND  |
| 八溴二苯醚                  | -    | mg/kg | 5   | ND  |
| 九溴二苯醚                  | -    | mg/kg | 5   | ND  |
| 十溴二苯醚                  | -    | mg/kg | 5   | ND  |
| 邻苯二甲酸二丁酯(DBP)          | 1000 | mg/kg | 50  | ND  |
| 邻苯二甲酸丁苄酯 (BBP)         | 1000 | mg/kg | 50  | ND  |
| 邻苯二甲酸二(2-乙基己基)酯 (DEHP) | 1000 | mg/kg | 50  | ND  |
| 邻苯二甲酸二异丁酯 (DIBP)       | 1000 | mg/kg | 50  | ND  |

备注:

- (1) 最大允许限值引用自RoHS指令(EU) 2015/863。
- (2) IEC 62321 系列等同于 EN 62321 系列。
- (3) ▼= a. 当六价铬的浓度高于0.13 µg/cm<sup>2</sup>时, 样品为阳性, 即含有六价铬;  
 b. 当六价铬的浓度为ND(低于0.10 µg/cm<sup>2</sup>)时, 样品为阴性, 即未检测到六价铬;  
 c. 当六价铬的浓度介于0.10 µg/cm<sup>2</sup>与0.13 µg/cm<sup>2</sup>之间时, 无法直接判定是否检测到六价铬, 因不同个体的样品表面差异可能会影响测定结果;

由于未获知样品的存储条件和生产日期, 样品的六价铬检测结果仅能代表检测时样品含六价铬的状态。除非另有说明, 参照ILAC-G8:09/2019, 使用简单接受 (w=0) 的二元判定规则进行符合性判定。除非另有说明, 此报告结果仅对检测的样品负责。本报告未经本公司书面许可, 不可部分复制。检测报告仅用于客户科研、教学、内部质量控制、产品研发等目的, 仅供内部参考。



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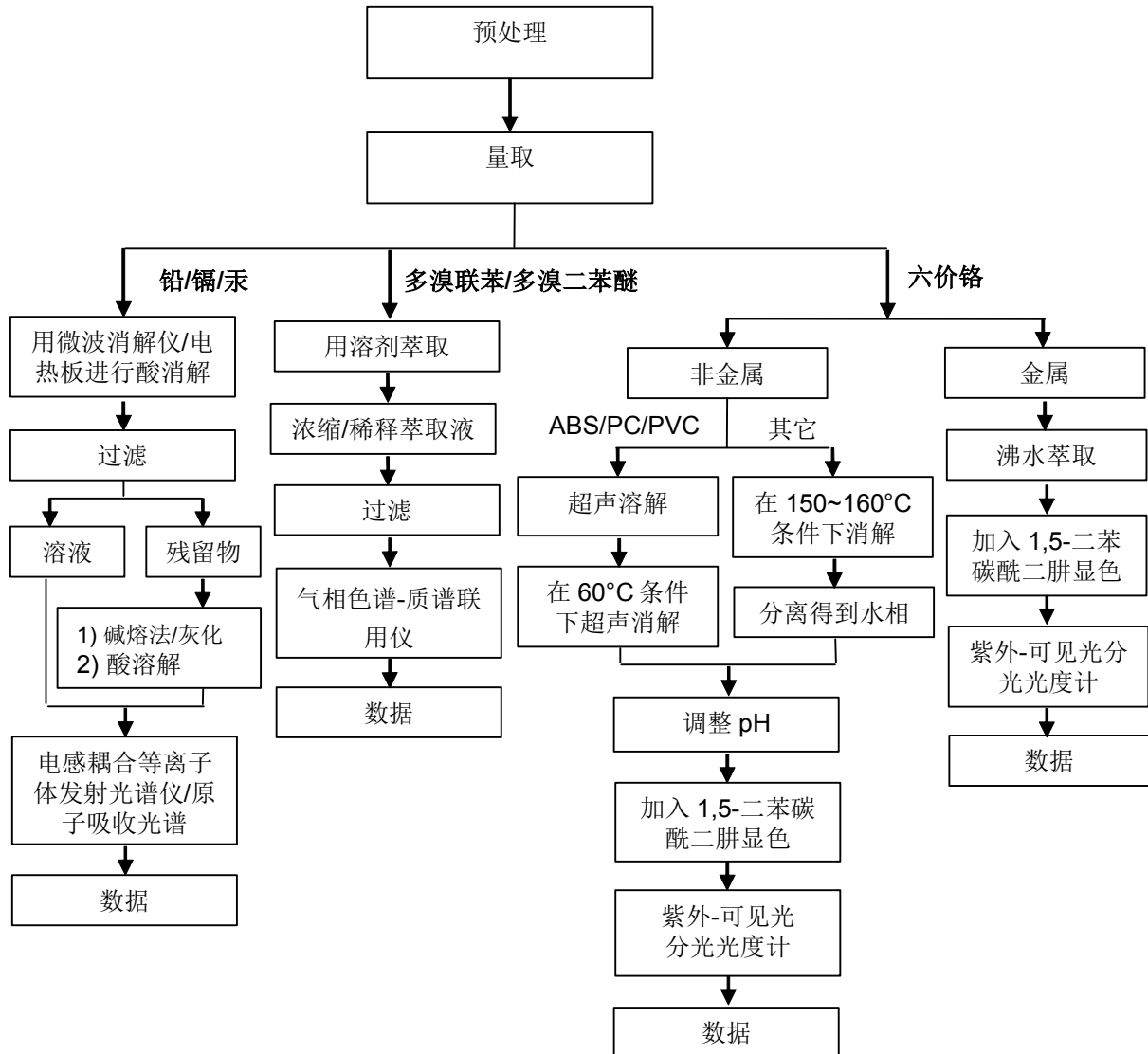
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附件

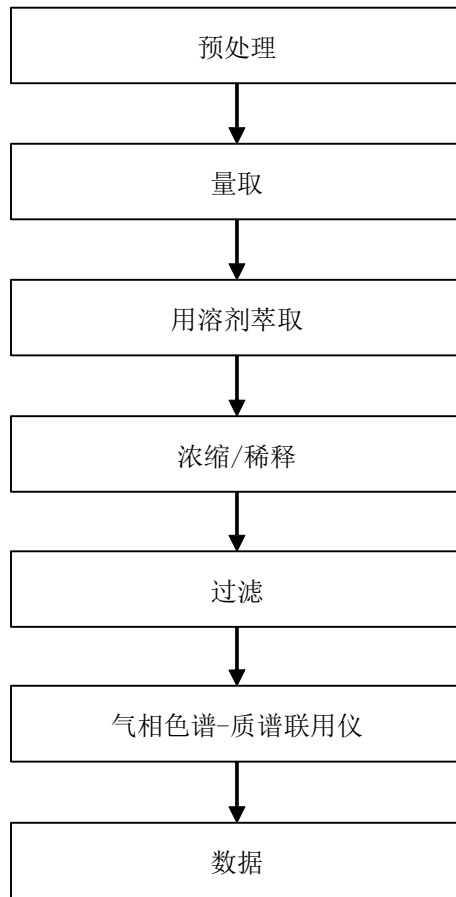
## Pb/Cd/Hg/Cr<sup>6+</sup>/PBBs/PBDEs 检测流程图

1) 样品按照下述流程被完全消解（六价铬和多溴联苯/多溴二苯醚测试除外）。



附件

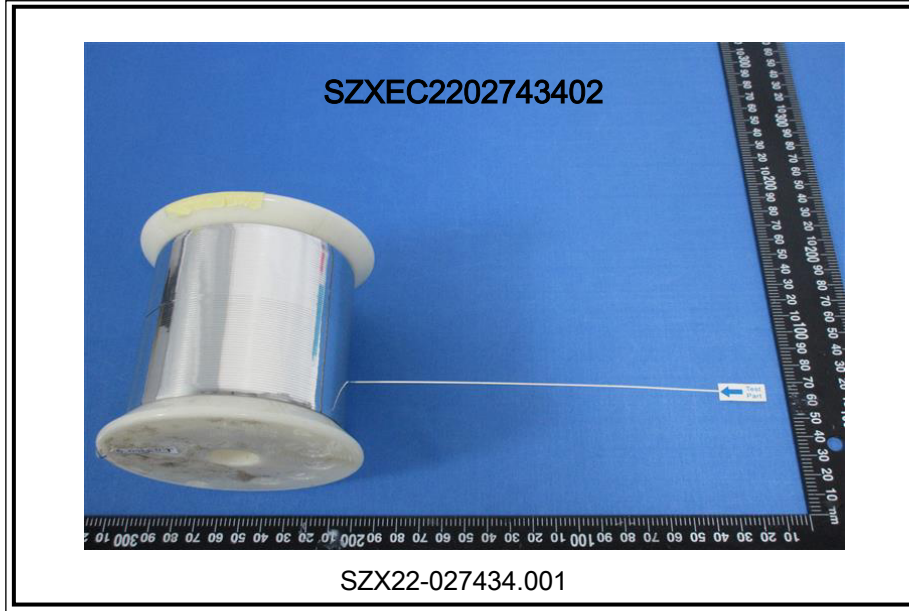
### Phthalates 检测流程图



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