

# TEST REPORT

## (시험성적서)

신청기관 (인) : (주)엘지화학  
Applicant : LG Chem. Ltd.

주소 (한글) : 충청북도 청주시 흥덕구 남촌리 1114-1 우)361-911  
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Chungcheongbuk-do, 361-911 Korea

발행면수 (Page) : 1 of 10  
발행일자 (Date) : 2017. 01. 13.

시험성적서 번호 (Report No.) : RT17R-U0054-023-K

시료 명세 : 시료에 대한 상세한 정보는 아래와 같음  
(Sample Description) (The following submitted sample(s) said to be)

제품명/형식 : Film  
(Name/Type of Product) (Film)

시료고유번호 : RT17R-U0054-023  
(Sample ID No.) (RT17R-U0054-023)

품번 : 1-1  
(Item No.) (1-1)

제품 생산자/공급자 : (주)엘지화학  
(Manufacturer/Vendor) (LG Chem. Ltd.)

시료접수일자 : 2017. 01. 09.  
(Sample received) (Jan. 09, 2017)

시험일자 : 2017. 01. 09. ~ 2017. 01. 13.  
(Testing Date) (Jan. 09, 2017 ~ Jan. 13, 2017)

시험유형 : RoHS 화학분석  
(Test Type) (RoHS wet chemical analysis)

시험방법 : 이 시험성적서의 다음 페이지 첨부  
(Test Method) (Please see the following page)

시험결과 : 이 시험성적서의 다음페이지에 첨부  
(Test Result) (Please see the following page)

- 비고 (Notes) : 1. 이 시험성적서는 제시된 시료 및 시료명으로 시험한 결과로서 유사 대상시료에 적용할 수 없음.  
(The Test Results presented in this report relate only to the object tested.)  
2. 이 시험성적서는 승인없이 복사 사용을 금함.  
(This report shall not be reproduced except in full without the written approval of the testing laboratory.)  
3. 이 시험성적서의 품번은 고객의 요청 및 보증서에 의거하여 명기함.  
(The item no. is assigned by client and indicated according to their requirement and guarantee letter.)

승인자 (Approved by)



이응용/기술책임자  
(E.Y.Lee/ Lab. Technical Manager)

권한자 (Authorized by)



유환우/소장  
(H.W.Yoo / Lab. General Manager)



Authenticity check

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시료고유번호 (Sample ID No.) : RT17R-U0054-023

시료명 (Sample Description) : Film  
(Film)

| 시험항목<br>(Test Item)                                               | 단위<br>(Unit) | 분석방법<br>(Test Method)                                                                                                        | 검출한계<br>(MDL) | 시험결과<br>(Result) |
|-------------------------------------------------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------|---------------|------------------|
| 카드뮴 (Cadmium, Cd)                                                 | mg/kg        | With reference to<br>IEC 62321-5 Edition 1.0 : 2013,<br>by acid digestion and<br>determined by ICP-OES                       | 0.5           | N.D.             |
| 납 (Lead, Pb)                                                      | mg/kg        |                                                                                                                              | 5             | N.D.             |
| 수은 (Mercury, Hg)                                                  | mg/kg        | With reference to<br>IEC 62321-4 Edition 1.0 : 2013,<br>by acid digestion and<br>determined by ICP-OES                       | 2             | N.D.             |
| 6가 크롬 (Hexavalent Chromium, Cr <sup>6+</sup> )<br>(For non-metal) | mg/kg        | With reference to<br>IEC 62321 Edition 1.0 : 2008,<br>by alkaline digestion and<br>determined by UV-VIS<br>Spectrophotometer | 1             | N.D.             |
| 폴리브로뮴화비페닐 (Polybrominated Biphenyls, PBBs)                        |              |                                                                                                                              |               |                  |
| 모노브로모비페닐 (MonoBB)                                                 | mg/kg        | With reference to<br>IEC 62321-6 Edition 1.0 : 2015,<br>by solvent extraction and<br>determined by GC/MS                     | 5             | N.D.             |
| 다이브로모비페닐 (DiBB)                                                   | mg/kg        |                                                                                                                              | 5             | N.D.             |
| 트라이브로모비페닐 (TriBB)                                                 | mg/kg        |                                                                                                                              | 5             | N.D.             |
| 테트라브로모비페닐 (TertaBB)                                               | mg/kg        |                                                                                                                              | 5             | N.D.             |
| 펜타브로모비페닐 (PentaBB)                                                | mg/kg        |                                                                                                                              | 5             | N.D.             |
| 헥사브로모비페닐 (HexaBB)                                                 | mg/kg        |                                                                                                                              | 5             | N.D.             |
| 헵타브로모비페닐 (HeptaBB)                                                | mg/kg        |                                                                                                                              | 5             | N.D.             |
| 옥타브로모비페닐 (OctaBB)                                                 | mg/kg        |                                                                                                                              | 5             | N.D.             |
| 노나브로모비페닐 (NonaBB)                                                 | mg/kg        |                                                                                                                              | 5             | N.D.             |
| 데카브로모비페닐 (DecaBB)                                                 | mg/kg        |                                                                                                                              | 5             | N.D.             |
| 폴리브로뮴화디페닐에테르 (Polybrominated Diphenyl Ethers, PBDEs)              |              |                                                                                                                              |               |                  |
| 모노브로모디페닐에테르 (MonoBDE)                                             | mg/kg        | With reference to<br>IEC 62321-6 Edition 1.0 : 2015,<br>by solvent extraction and<br>determined by GC/MS                     | 5             | N.D.             |
| 다이브로모디페닐에테르 (DiBDE)                                               | mg/kg        |                                                                                                                              | 5             | N.D.             |
| 트라이브로모디페닐에테르 (TriBDE)                                             | mg/kg        |                                                                                                                              | 5             | N.D.             |
| 테트라브로모디페닐에테르 (TetraBDE)                                           | mg/kg        |                                                                                                                              | 5             | N.D.             |
| 펜타브로모디페닐에테르 (PentaBDE)                                            | mg/kg        |                                                                                                                              | 5             | N.D.             |
| 헥사브로모디페닐에테르 (HexaBDE)                                             | mg/kg        |                                                                                                                              | 5             | N.D.             |
| 헵타브로모디페닐에테르 (HeptaBDE)                                            | mg/kg        |                                                                                                                              | 5             | N.D.             |
| 옥타브로모디페닐에테르 (OctaBDE)                                             | mg/kg        |                                                                                                                              | 5             | N.D.             |
| 노나브로모디페닐에테르 (NonaBDE)                                             | mg/kg        |                                                                                                                              | 5             | N.D.             |
| 데카브로모디페닐에테르 (DecaBDE)                                             | mg/kg        |                                                                                                                              | 5             | N.D.             |

Tested by : MB Song, SH Kim, JH Jin

Notes : mg/kg = ppm = parts per million (함량 표시 : 백만분의 일)

< = Less than (결과 값 이하)

N.D. = Not detected (< MDL, 미검출 - 검출한계 이하)

MDL = Method detection limit (검출한계)

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시료고유번호 (Sample ID No.) : RT17R-U0054-023

시료명 (Sample Description) : Film  
(Film)

| 시험항목<br>(Test Item)                  | CAS번호<br>(CAS No.) | 단위<br>(Unit) | 분석방법<br>(Test Method)                                                                                    | 검출한계<br>(MDL) | 시험결과<br>(Result) |
|--------------------------------------|--------------------|--------------|----------------------------------------------------------------------------------------------------------|---------------|------------------|
| 프탈레이트 (Phthalates)                   |                    |              |                                                                                                          |               |                  |
| Dibutyl phthalate<br>(DBP)           | 84-74-2            | mg/kg        | With reference to<br>IEC 62321-8<br>(111/321/CD),<br>by solvent extraction<br>and determined<br>by GC/MS | 50            | N.D.             |
| Di(2-ethylhexyl) phthalate<br>(DEHP) | 117-81-7           | mg/kg        |                                                                                                          | 50            | N.D.             |
| Benzyl butyl phthalate<br>(BBP)      | 85-68-7            | mg/kg        |                                                                                                          | 50            | N.D.             |
| Diisobutyl phthalate<br>(DIBP)       | 84-69-5            | mg/kg        |                                                                                                          | 50            | N.D.             |

Tested by : MB Song

Notes : mg/kg = ppm = parts per million (함량 표시 : 백만분의 일)

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시료고유번호 (Sample ID No.) : RT17R-U0054-023

시료명 (Sample Description) : Film  
(Film)

| 시험항목<br>(Test Item)              | 단위<br>(Unit) | 분석방법<br>(Test Method)                                                           | 검출한계<br>(MDL) | 시험결과<br>(Result) |
|----------------------------------|--------------|---------------------------------------------------------------------------------|---------------|------------------|
| 안티몬 (Antimony, Sb)               | mg/kg        | With reference to US EPA 3052, by acid digestion and determined by ICP-OES      | 2             | 119              |
| 주석 (Tin, Sn)                     | mg/kg        | With reference to US EPA 3052, by acid digestion and determined by ICP-OES      | 2             | N.D.             |
| 브롬 (Bromine, Br)                 | mg/kg        | With reference to EN 14582, by oxygen combustion with bomb and determined by IC | 30            | N.D.             |
| 염소 (Chlorine, Cl)                | mg/kg        | With reference to EN 14582, by oxygen combustion with bomb and determined by IC | 30            | N.D.             |
| 폴리염화비닐 (Polyvinyl chloride, PVC) | -            | With reference to KS K 0210-1, and determined by FT-IR                          | N.A.          | Negative         |

Tested by : MB Song, SH Kim

Notes : mg/kg = ppm = parts per million (함량 표시 : 백만분의 일)

< = Less than (결과 값 이하)

N.D. = Not detected (< MDL, 미검출 - 검출한계 이하)

MDL = Method detection limit (검출한계)

N.A. = Not applicable (해당없음)

Negative = Undetectable (동종물질 불검출)

Positive = Detectable (동종물질 검출)

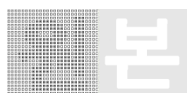
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시험성적서 번호 (Report No.) : RT17R-U0054-023-K

시료고유번호 (Sample ID No.) : RT17R-U0054-023

시료명 (Sample Description) : Film  
(Film)\* 시료 접수 시 시료 상태 :  
(View of sample as received)**Intertek Testing Services Korea Ltd.**

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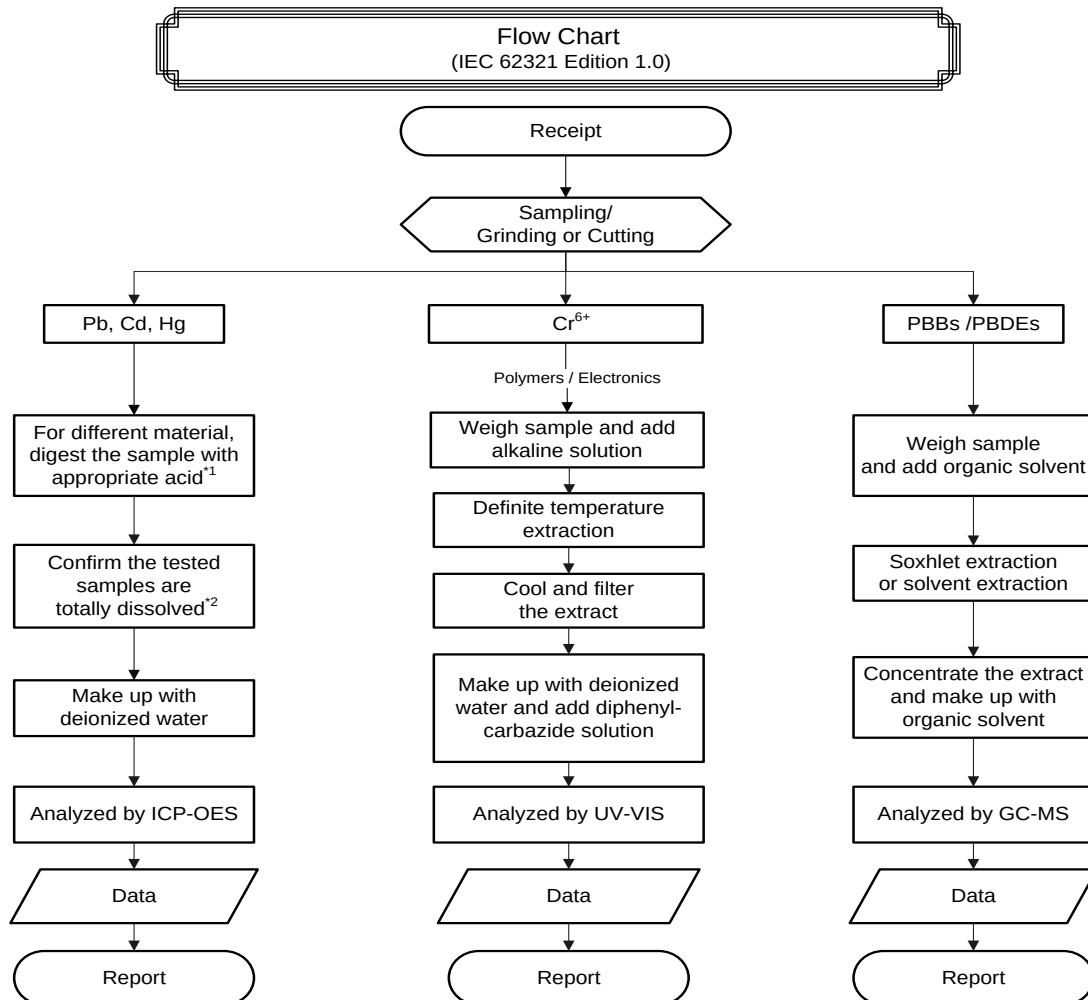
(시험 성적서)

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시료고유번호 (Sample ID No.) : RT17R-U0054-023

시료명 (Sample Description) : Film  
(Film)

Remarks :

\*1 : List of appropriate acid :

| Material    | Acid added for digestion                                                                   |
|-------------|--------------------------------------------------------------------------------------------|
| Polymers    | HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub> , H <sub>3</sub> BO <sub>3</sub> |
| Metals      | HNO <sub>3</sub> , HCl, HF                                                                 |
| Electronics | HNO <sub>3</sub> , HCl, H <sub>2</sub> O <sub>2</sub> , HBF <sub>4</sub>                   |

\*2 : The samples were dissolved totally by pre-conditioning method according to above flow chart.

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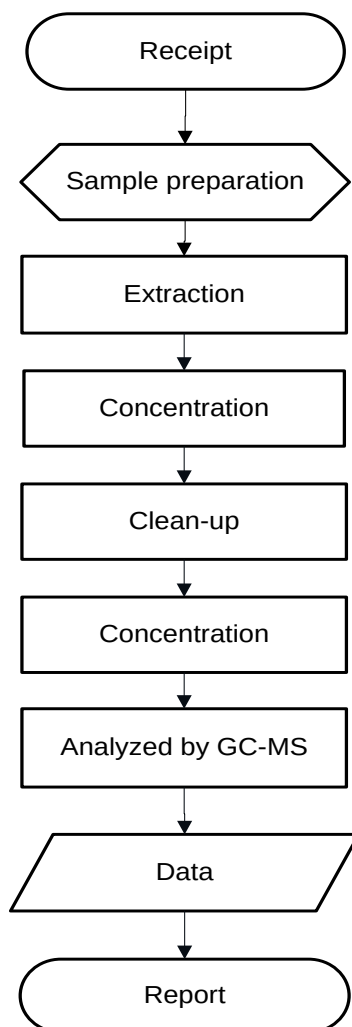
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시료고유번호 (Sample ID No.) : RT17R-U0054-023

시료명 (Sample Description) : Film  
(Film)

## Flow Chart (Phthalates)



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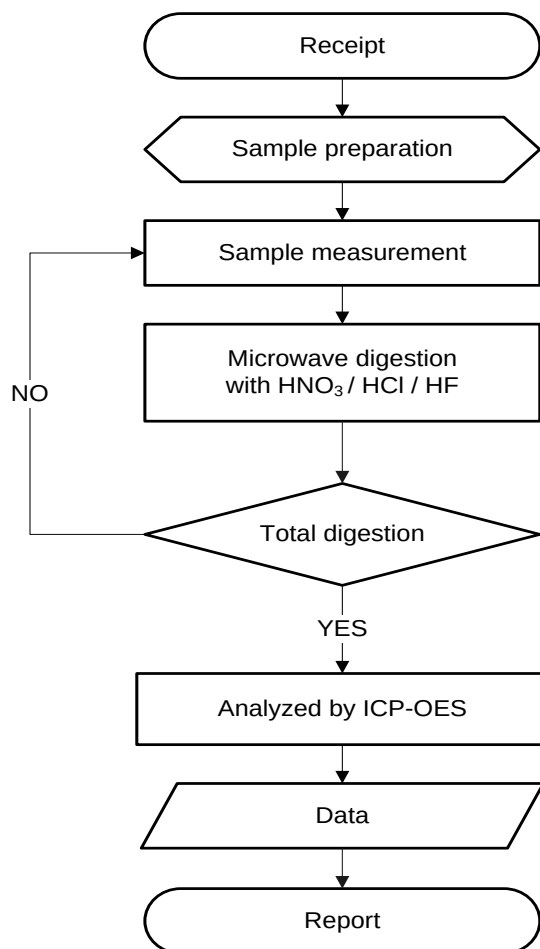
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시료고유번호 (Sample ID No.) : RT17R-U0054-023

시료명 (Sample Description) : Film  
(Film)

## Flow Chart (Metal Testing)



\*\* Remarks : The samples were dissolved totally by pre-conditioning method according to above flow chart.

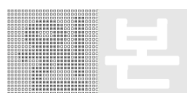
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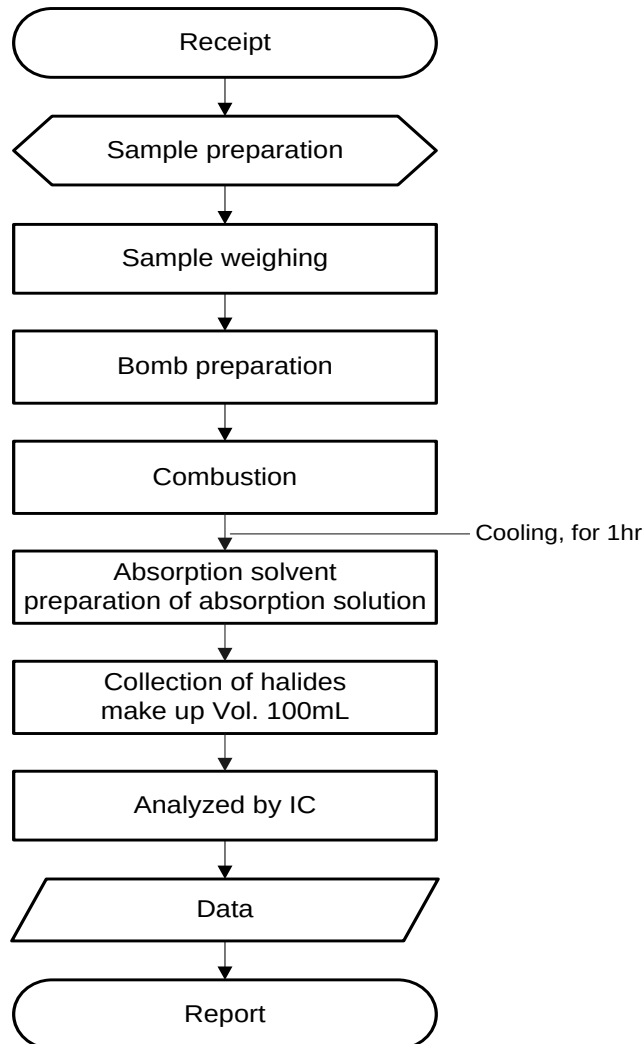
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시료명 (Sample Description) : Film  
(Film)

## Flow Chart (Halogen)



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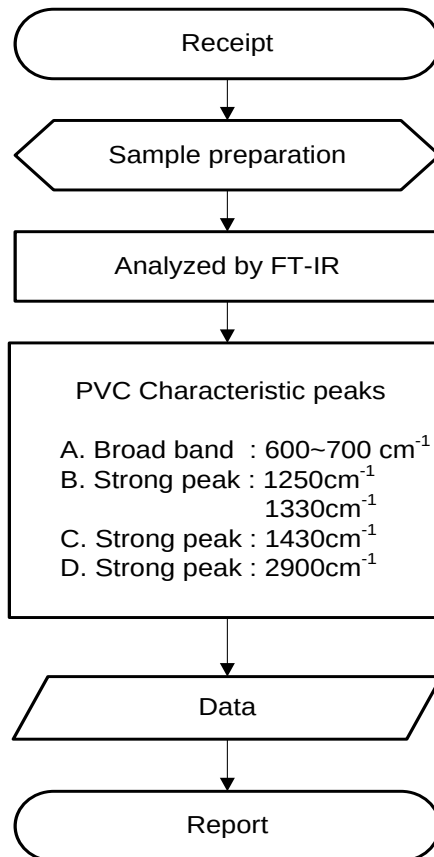
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시료고유번호 (Sample ID No.) : RT17R-U0054-023

시료명 (Sample Description) : Film  
(Film)

## Flow Chart (PVC)



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

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