

## TEST REPORT (시험 성적서)

신청기관 (인) : (주)한샘디지털  
 APPLICANT : Hansaem Digitec

주소 (한글) : 인천광역시 서구 석남로 15  
 ADDRESS (ENGL.) : 15, Seongnam-ro, Seo-gu,  
 Incheon, Korea

발행면수 (PAGE) : 1 of 5  
 발행일자 (DATE) : 2024. 02. 06.

시험성적서 번호 (REPORT NO.) : RT24R-S0882-001-K

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

제품명/형식 (NAME/TYPE OF PRODUCT) : HANSAEM DIGITEC PCB-Sn\_HAL  
 (HANSAEM DIGITEC PCB-Sn\_HAL)

재질 (NAME OF MATERIAL) : PCB  
 (PCB)

시료고유번호 (SAMPLE ID NO.) : RT24R-S0882-001  
 (RT24R-S0882-001)

제품 생산자/공급자 (MANUFACTURER/VENDOR) : (주)한샘디지털  
 (Hansaem Digitec)

제출처 (NAME OF BUYER) : SEC  
 (SEC)

시료접수일자 (SAMPLE RECEIVED) : 2024. 01. 31.  
 (Jan. 31, 2024)

시험일자 (TESTING DATE) : 2024. 01. 31. ~ 2024. 02. 06.  
 (Jan. 31, 2024 ~ Feb. 06, 2024)

시험방법 (TEST METHOD) : 이 시험성적서의 다음 페이지 첨부  
 (Please see the following page)

시험결과 (TEST RESULT) : 이 시험성적서의 다음 페이지 첨부  
 (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 refer 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.)

승인자 (Approved by)



장준용/기술책임자  
 (Jade Jang / Lab. Technical Manager)

권한자 (Authorized by)



박병욱/소장  
 (Bo Park / Lab. General Manager)



Authenticity check



**TEST REPORT**  
(시험성적서)

발행면수 (PAGE) : 2 of 5  
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시험성적서 번호 (REPORT NO.) : RT24R-S0882-001-K  
시료고유번호 (SAMPLE ID NO.) : RT24R-S0882-001  
시료명 (SAMPLE DESCRIPTION) : HANSAEM DIGITEC PCB-Sn\_HAL  
(HANSAEM DIGITEC PCB-Sn\_HAL)

시험항목 (TEST ITEM)	단위 (UNIT)	분석방법 (TEST METHOD)	검출한계 (MDL)	시험결과 (RESULT)
카드뮴 (Cadmium, Cd)	mg/kg	With reference to IEC 62321-5 Edition 1.0 : 2013, by acid digestion and determined by ICP-OES	0.5	N.D.
납 (Lead, Pb)	mg/kg		5	N.D.
수은 (Mercury, Hg)	mg/kg	With reference to IEC 62321-4 : 2013/AMD1 : 2017, by acid digestion and determined by ICP-OES	2	N.D.
6가 크롬 (Hexavalent Chromium, Cr <sup>6+</sup> )	mg/kg	With reference to IEC 62321-7-2 Edition 1.0 : 2017, by alkaline/toluene digestion and determined by UV-VIS Spectrophotometer	8	N.D.
<b>폴리브로화비페닐 (Polybrominated Biphenyls, PBBs)</b>				
모노브로모비페닐 (MonoBB)	mg/kg	With reference to IEC 62321-6 Edition 1.0 : 2015, by solvent extraction and 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.
<b>폴리브로화디페닐에테르 (Polybrominated Diphenyl Ethers, PBDEs)</b>				
모노브로모디페닐에테르 (MonoBDE)	mg/kg	With reference to IEC 62321-6 Edition 1.0 : 2015, by solvent extraction and 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 : Jooyeon Lee, Chano Kim, Hayan Park

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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Seoul Lab. Address : 7, Ahasan-ro 5-gil, Seongdong-gu, Seoul, 04793 Korea



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**TEST REPORT**  
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발행면수 (PAGE) : 3 of 5

발행일자 (DATE) : 2024. 02. 06.

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시료고유번호 (SAMPLE ID NO.) : RT24R-S0882-001

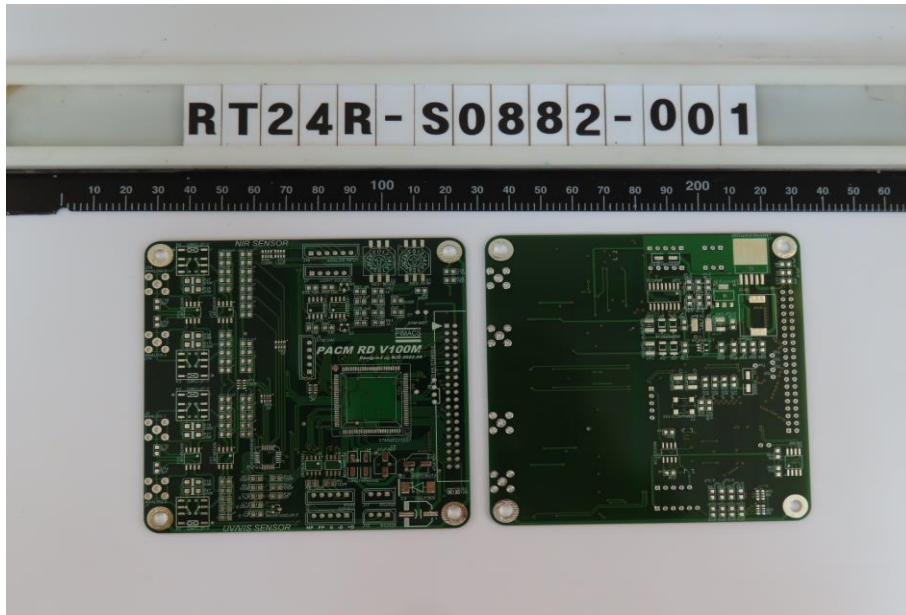
시료명 (SAMPLE DESCRIPTION) : HANSAEM DIGITEC PCB-Sn\_HAL  
(HANSAEM DIGITEC PCB-Sn\_HAL)

시험항목 (TEST ITEM)	CAS번호 (CAS NO.)	단위 (UNIT)	분석방법 (TEST METHOD)	검출한계 (MDL)	시험결과 (RESULT)
디부틸프탈레이트 (Dibutyl phthalate, DBP)	84-74-2	mg/kg	With reference to IEC 62321-8 Edition 1.0 : 2017, by solvent extraction and determined by GC/MS	50	N.D.
디에틸헥실프탈레이트 (Di-(2-ethylhexyl) phthalate, DEHP)	117-81-7	mg/kg		50	N.D.
벤질부틸프탈레이트 (Benzyl butyl phthalate, BBP)	85-68-7	mg/kg		50	N.D.
디이소부틸프탈레이트 (Diisobutyl phthalate, DIBP)	84-69-5	mg/kg		50	N.D.

Tested by : Hayan Park

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)

\* 시료 접수 시 시료 상태 :  
(View of sample as received)



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# TEST REPORT

## (시험성적서)

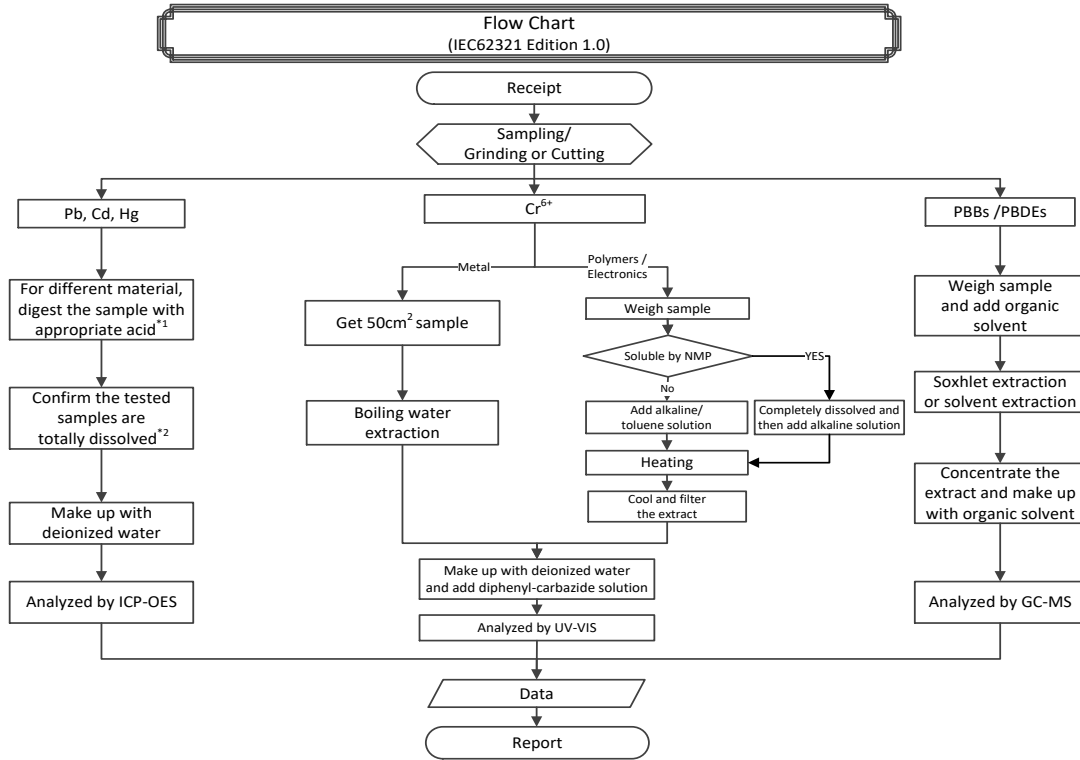
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**Remarks :**

\*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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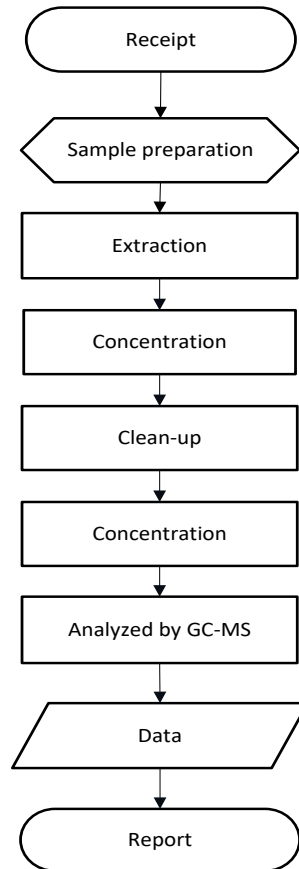
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### Flow Chart (Phthalates)



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

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