

TEST REPORT (시험 성적서)

신청기관 (인) : 삼화콘덴서
APPLICANT : SAMWHA CAPACITOR Co., Ltd.
주소 (한글) : 경기도 용인시 남사면 경기동로 227
ADDRESS (ENGL.) : 227, Gyeonggidong-ro, Namsa-myeon, Cheoin-gu,
Yongin-si, Gyeonggi-do, Korea

발행면수 (PAGE) : 1 of 9
발행일자 (DATE) : 2020. 03. 17.

시험성적서 번호 (REPORT NO.) : RT20R-S1139-001-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) : CHIP BEAD
(CHIP BEAD)

재질 (NAME OF MATERIAL) : Ferrite
(Ferrite)

시료고유번호 (SAMPLE ID NO.) : RT20R-S1139-001
(RT20R-S1139-001)

품번 (ITEM NO.) : CB
(CB)

제품 생산자/공급자 (MANUFACTURER/VENDOR) : 삼화콘덴서
(SAMWHA CAPACITOR Co., Ltd.)

제출처 (NAME OF BUYER) : SAMSUNG, LG, Hynix
(SAMSUNG, LG, Hynix)

시료접수일자 (SAMPLE RECEIVED) : 2020. 03. 11.
(Mar. 11, 2020)

시험일자 (TESTING DATE) : 2020. 03. 11. ~ 2020. 03. 17.
(Mar. 11, 2020 ~ Mar. 17, 2020)

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.)
 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)

권한자 (Authorized by)





Authenticity check

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

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

Intertek Testing Services Korea Ltd.
Seoul Office: Tel : 02-6090-9550 Fax : 02-3409-0025 Web Site : intertek.co.kr
Seoul Lab. Address : 7, Ahasan-ro 5-gil, Seongdong-gu, Seoul, 04793 Korea
Ulsan Lab. Address : 34, Yongam-gil, Chongryang-myeon, Ulju-gun, Ulsan 44989 Korea



※ You can verify the forgery and authenticity by the barcode at the end of this document.

TEST REPORT (시험 성적서)

발행면수 (PAGE) : 2 of 9

발행일자 (DATE) : 2020. 03. 17.

시험성적서 번호 (REPORT NO.) : RT20R-S1139-001-K

시료고유번호 (SAMPLE ID NO.) : RT20R-S1139-001

시료명 (SAMPLE DESCRIPTION) : CHIP BEAD
(CHIP BEAD)

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 Edition 1.0 : 2013, by acid digestion and determined by ICP-OES	2	N.D.
6가 크롬 (Hexavalent Chromium, Cr ⁶⁺)	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.
폴리브로화비페닐 (Polybrominated Biphenyls, PBBs)				
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.
폴리브로화디페닐에테르 (Polybrominated Diphenyl Ethers, PBDEs)				
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, Seulgi Park, Miseon Lee

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)

Intertek Testing Services Korea Ltd.

Seoul Office: Tel : 02-6090-9550 Fax : 02-3409-0025 Web Site : intertek.co.kr

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

Ulsan Lab. Address : 34, Yongam-gil, Chongryang-myeon, Ulju-gun, Ulsan 44989 Korea



※ You can verify the forgery and authenticity by the barcode at the end of this document.

TEST REPORT (시험 성적서)

발행면수 (PAGE) : 3 of 9

발행일자 (DATE) : 2020. 03. 17.

시험성적서 번호 (REPORT NO.) : RT20R-S1139-001-K

시료고유번호 (SAMPLE ID NO.) : RT20R-S1139-001

시료명 (SAMPLE DESCRIPTION) : CHIP BEAD

(CHIP BEAD)

시험항목 (TEST ITEM)	단위 (UNIT)	분석방법 (TEST METHOD)	검출한계 (MDL)	시험결과 (RESULT)
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	139
플루오르 (Fluorine, F)	mg/kg	With reference to EN 14582, by oxygen combustion with bomb and determined by IC	30	94
요오드 (Iodine, I)	mg/kg	With reference to EN 14582, by oxygen combustion with bomb and determined by IC	30	N.D.
베릴륨 (Beryllium, Be)	mg/kg	With reference to US EPA 3052, by acid digestion and determined by ICP-OES	2	N.D.
안티몬 (Antimony, Sb)	mg/kg	With reference to US EPA 3052, by acid digestion and determined by ICP-OES	2	N.D.

Tested by : Hyojoo Kim, Jooyeon Lee

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)

Intertek Testing Services Korea Ltd.

Seoul Office: Tel : 02-6090-9550 Fax : 02-3409-0025 Web Site : intertek.co.kr

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

Ulsan Lab. Address : 34, Yongam-gil, Chongryang-myeon, Ulju-gun, Ulsan 44989 Korea



※ You can verify the forgery and authenticity by the barcode at the end of this document.

TEST REPORT (시험 성적서)

발행면수 (PAGE) : 4 of 9

발행일자 (DATE) : 2020. 03. 17.

시험성적서 번호 (REPORT NO.) : RT20R-S1139-001-K

시료고유번호 (SAMPLE ID NO.) : RT20R-S1139-001

시료명 (SAMPLE DESCRIPTION) : CHIP BEAD

(CHIP BEAD)

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.
디엔옥틸프탈레이트 (Di-n-octyl phthalate, DNOP)	117-84-0	mg/kg		50	N.D.
디이소노닐프탈레이트 (Diisononyl phthalate, DINP)	28553-12-0 68515-48-0	mg/kg		100	N.D.
디이소데실프탈레이트 (Diisodecyl phthalate, DIDP)	26761-40-0 68515-49-1	mg/kg		100	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.
디엔펜틸프탈레이트 (Di-n-pentyl phthalate, DPP)	131-18-0	mg/kg		50	N.D.
디엔헥실프탈레이트 (Di-n-hexyl phthalate, DNHP)	84-75-3	mg/kg		50	N.D.
디(2-메톡시에틸)프탈레이트 (Di(2-methoxyethyl) phthalate, DMEP)	117-82-8	mg/kg		50	N.D.
디이소펜틸프탈레이트 (Diisopentylphthalate, DIPP)	605-50-5	mg/kg		50	N.D.
엔펜틸이소펜틸프탈레이트 (N-pentyl-isopentylphthalate, NPIP)	776297-69-9	mg/kg		50	N.D.

Tested by : Miseon Lee

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)

Intertek Testing Services Korea Ltd.

Seoul Office: Tel : 02-6090-9550 Fax : 02-3409-0025 Web Site : intertek.co.kr

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

Ulsan Lab. Address : 34, Yongam-gil, Chongryang-myeon, Ulju-gun, Ulsan 44989 Korea



※ You can verify the forgery and authenticity by the barcode at the end of this document.

TEST REPORT (시험 성적서)

발행면수 (PAGE) : 5 of 9

발행일자 (DATE) : 2020. 03. 17.

시험성적서 번호 (REPORT NO.) : RT20R-S1139-001-K

시료고유번호 (SAMPLE ID NO.) : RT20R-S1139-001

시료명 (SAMPLE DESCRIPTION) : CHIP BEAD
(CHIP BEAD)

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



Intertek Testing Services Korea Ltd.

Seoul Office: Tel : 02-6090-9550 Fax : 02-3409-0025 Web Site : intertek.co.kr

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

Ulsan Lab. Address : 34, Yongam-gil, Chongryang-myeon, Ulju-gun, Ulsan 44989 Korea



※ You can verify the forgery and authenticity by the barcode at the end of this document.

TEST REPORT (시험 성적서)

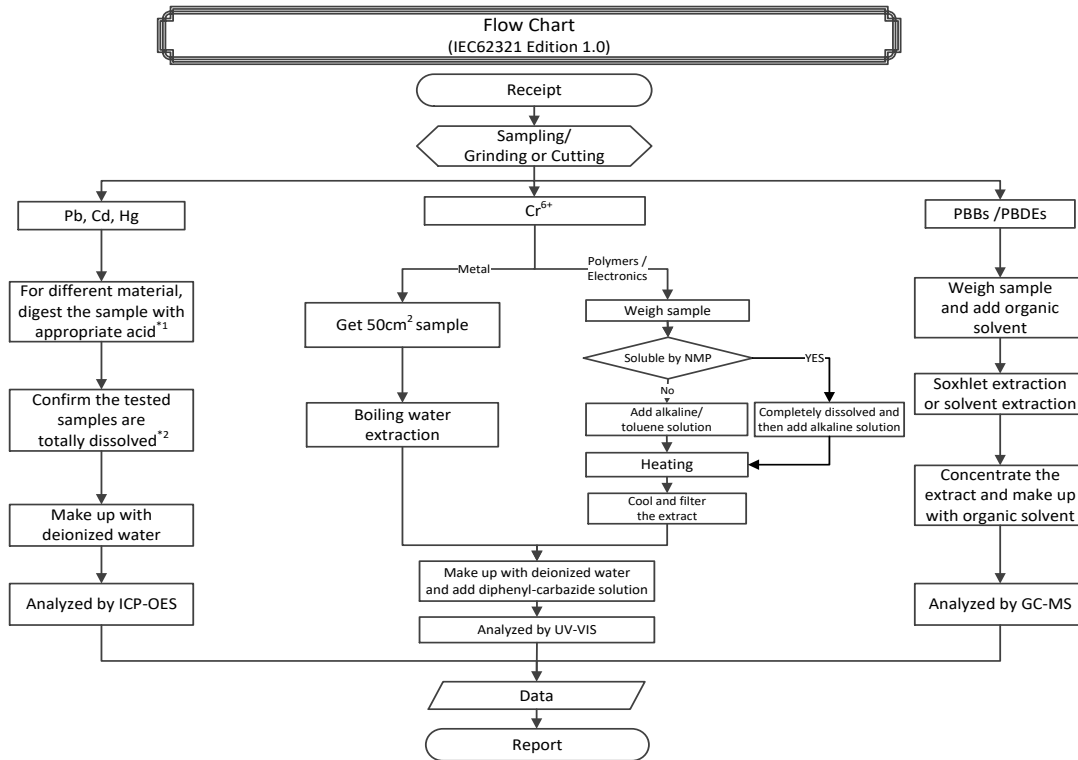
발행면수 (PAGE) : 6 of 9

발행일자 (DATE) : 2020. 03. 17.

시험성적서 번호 (REPORT NO.) : RT20R-S1139-001-K

시료고유번호 (SAMPLE ID NO.) : RT20R-S1139-001

시료명 (SAMPLE DESCRIPTION) : CHIP BEAD
(CHIP BEAD)



Remarks :

*1 : List of appropriate acid :

Material	Acid added for digestion
Polymers	HNO ₃ , HCl, HF, H ₂ O ₂ , H ₃ BO ₃
Metals	HNO ₃ , HCl, HF
Electronics	HNO ₃ , HCl, H ₂ O ₂ , HBF ₄

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

Intertek Testing Services Korea Ltd.

Seoul Office: Tel : 02-6090-9550 Fax : 02-3409-0025 Web Site : intertek.co.kr

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

Ulsan Lab. Address : 34, Yongam-gil, Chongryang-myeon, Ulju-gun, Ulsan 44989 Korea



※ You can verify the forgery and authenticity by the barcode at the end of this document.

TEST REPORT (시험 성적서)

발행면수 (PAGE) : 7 of 9

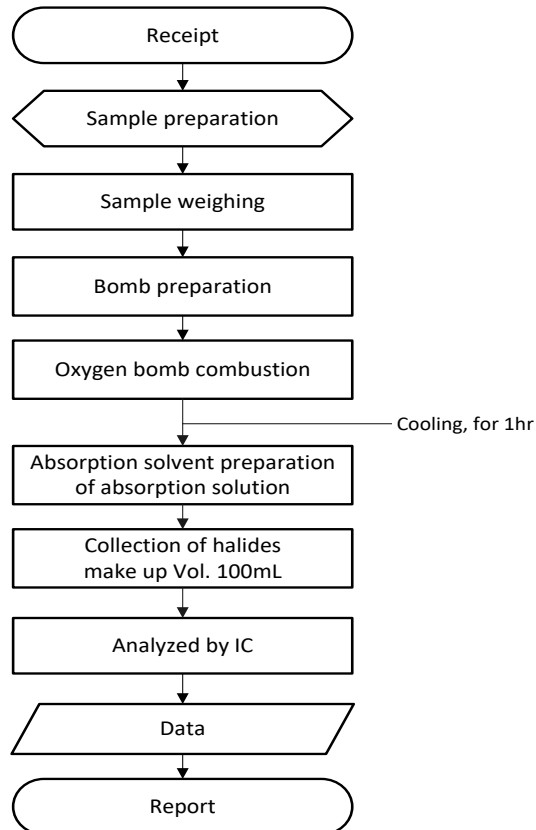
발행일자 (DATE) : 2020. 03. 17.

시험성적서 번호 (REPORT NO.) : RT20R-S1139-001-K

시료고유번호 (SAMPLE ID NO.) : RT20R-S1139-001

시료명 (SAMPLE DESCRIPTION) : CHIP BEAD
(CHIP BEAD)

Flow Chart (EN14582)



Intertek Testing Services Korea Ltd.

Seoul Office: Tel : 02-6090-9550 Fax : 02-3409-0025 Web Site : intertek.co.kr

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

Ulsan Lab. Address : 34, Yongam-gil, Chongryang-myeon, Ulju-gun, Ulsan 44989 Korea



※ You can verify the forgery and authenticity by the barcode at the end of this document.

TEST REPORT (시험 성적서)

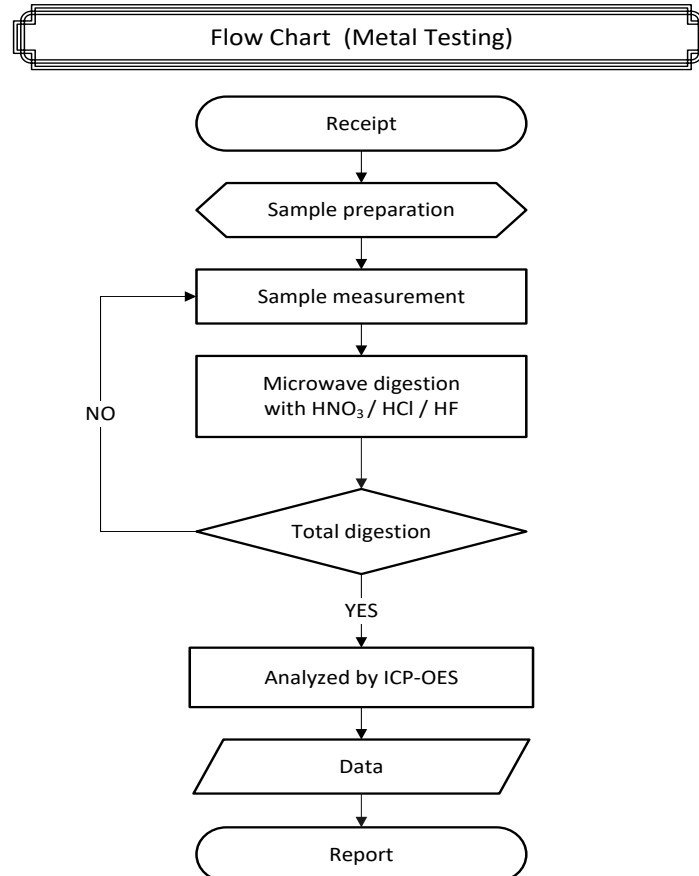
발행면수 (PAGE) : 8 of 9

발행일자 (DATE) : 2020. 03. 17.

시험성적서 번호 (REPORT NO.) : RT20R-S1139-001-K

시료고유번호 (SAMPLE ID NO.) : RT20R-S1139-001

시료명 (SAMPLE DESCRIPTION) : CHIP BEAD
(CHIP BEAD)



**** 비고 :** 이 샘플은 위의 흐름도에 따른 전처리 방법에 의해 완전용해 되었음.
(The samples were dissolved totally by pre-conditioning method according to above flow chart.)

Intertek Testing Services Korea Ltd.

Seoul Office: Tel : 02-6090-9550 Fax : 02-3409-0025 Web Site : intertek.co.kr

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

Ulsan Lab. Address : 34, Yongam-gil, Chongryang-myeon, Ulju-gun, Ulsan 44989 Korea



※ You can verify the forgery and authenticity by the barcode at the end of this document.

TEST REPORT (시험 성적서)

발행면수 (PAGE) : 9 of 9

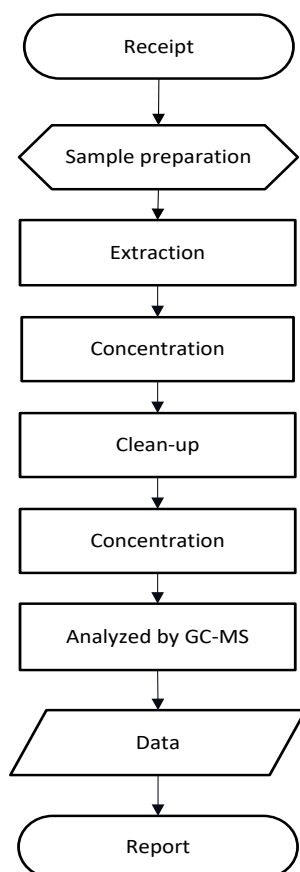
발행일자 (DATE) : 2020. 03. 17.

시험성적서 번호 (REPORT NO.) : RT20R-S1139-001-K

시료고유번호 (SAMPLE ID NO.) : RT20R-S1139-001

시료명 (SAMPLE DESCRIPTION) : CHIP BEAD
(CHIP BEAD)

Flow Chart (Phthalates)



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

Except where explicitly agreed in writing, all work and services performed by Intertek is subject to our standard Terms and Conditions which can be obtained at our website: <http://www.intertek.com/terms/>. Intertek's responsibility and liability are limited to the terms and conditions of the agreement.

This report is made solely on the basis of your instructions and / or information and materials supplied by you and provide no warranty on the tested sample(s) be truly representative of the sample source. The report is not intended to be a recommendation for any particular course of action, you are responsible for acting as you see fit on the basis of the report results. Intertek is under no obligation to refer to or report upon any facts or circumstances which are outside the specific instructions received and accepts no responsibility to any parties whatsoever, following the issue of the report, for any matters arising outside the agreed scope of the works. This report does not discharge or release you from your legal obligations and duties to any other person. You are the only one authorized to permit copying or distribution of this report (and then only in its entirety). Any such third parties to whom this report may be circulated rely on the content of the report solely at their own risk.

This report shall not be reproduced, except in full.

This report is not related to the scope of Korea Laboratory Accreditation Scheme.

Intertek Testing Services Korea Ltd.

Seoul Office: Tel : 02-6090-9550 Fax : 02-3409-0025 Web Site : intertek.co.kr

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

Ulsan Lab. Address : 34, Yongam-gil, Chongryang-myeon, Ulju-gun, Ulsan 44989 Korea



※ You can verify the forgery and authenticity by the barcode at the end of this document.