



인류의 안전을 추구하고 미래기술을 선도하는

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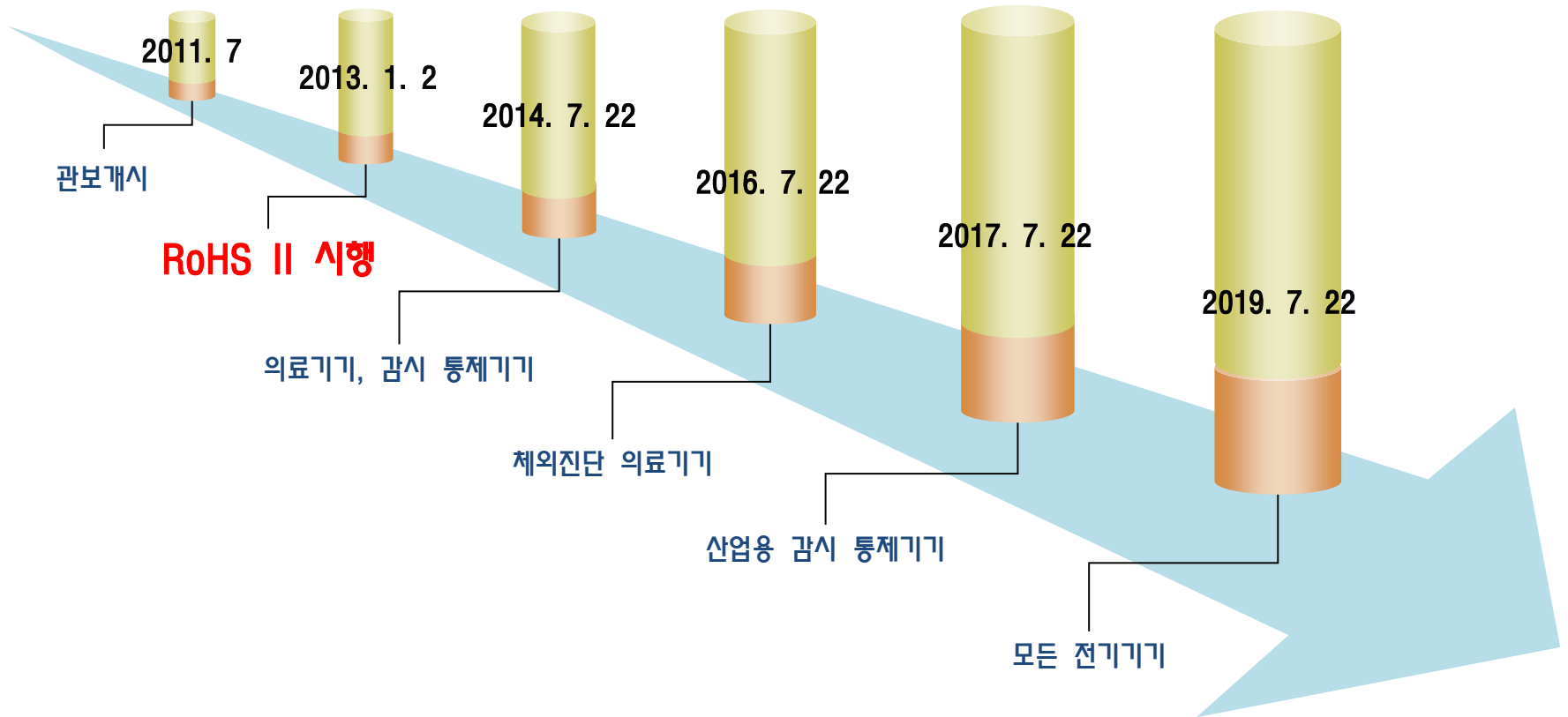
KOTITI

Testing & Research Institute

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RoHS II 일정



EU로 수출되는 전기전자 제품은 Safety, EMC 등에 대한 검증을 통한 CE Marking을 하였으나, RoHS II 시행으로 RoHS II 를 만족하지 않고 CE Marking을 할 수 없음

RoHS II 내용

1. 대상 제품군 확대

3. Paragraph 1 shall apply to medical devices and monitoring and control instruments which are placed on the market from 22 July 2014, to in vitro diagnostic medical devices which are placed on the market from 22 July 2016 and to industrial monitoring and control instruments which are placed on the market from 22 July 2017.

4. Paragraph 1 shall not apply to cables or spare parts for the repair, the reuse, the updating of functionalities or upgrading of capacity of the following:

- (a) EEE placed on the market before 1 July 2006;
- (b) medical devices placed on the market before 22 July 2014;
- (c) in vitro diagnostic medical devices placed on the market before 22 July 2016;
- (d) monitoring and control instruments placed on the market before 22 July 2014;
- (e) industrial monitoring and control instruments placed on the market before 22 July 2017;
- (f) EEE which benefited from an exemption and which was placed on the market before that exemption expired as far as that specific exemption is concerned.

✓ EU RoHS II 지침은 2012년 7월 21일 발효되었으며, 2013년 1월 2일 시행되었음

✓ 기존 EU RoHS 지침이 적용되었던 제품은 계속해서 적용되며, 새로 추가되는 제품군 8, 9, 11은 다음 일정에 맞춰 단계적으로 지침이 적용되도록 되어있음

1. 의료기기, 계측기기, 컨트롤 기기 : 2014년 7월 22일
2. 체외 진단용 의료기기 : 2016년 7월 22일
3. 산업용 계측 및 컨트롤 기기 : 2017년 7월 22일

RoHS II 내용

1-1. 의료기기 범위

✓ 전지, 전자제품 또는 “EEE” 는 올바르게 작동하기 위하여 전류 또는 전자기장에 의존하는 제품과 전류의 생산, 전달과 측정을 위한 제품을 의미하며 교류 1,000 볼트와 직류 1,500 볼트를 초과하지 않는 정격 전압에서 사용되도록 설계된 제품을 의미한다.

1. “의료기기” 는 지침 93/42/EEC의 제 1조 (2)의 (a)항의 의미 내의 의료기기를 의미
2. “체외 진단 의료기기” 는 지침 98/79/EC의 제 1조 (2)의 (c)항 의미 내의 의료기기를 의미
3. “이식 가능한 능동 의료기기” 는 이식 가능한 의료기기와 관련 90/385/EEC의 제 1조 (2)의 (c)항의 의미 내의 이식 가능한 능동 의료기기를 의미

- ✓ 93/42/EEC, 의료기기 지침(MDD) : 교정용 안경, 병원용 침대, 초음파 진단기, MRI, 전기 수술기, 광선조사기 등
- ✓ 98/79/EC, 체외진단용 의료기기(IVD) : 감염진단 키트, 에이즈 감염진단 키트, 혈액검사기 등
- ✓ 90/385/EEC, 능동이식 의료기기 : 심장 박동기, 심장 충격기, 위 자극기, 팔약근 자극기, 혈액 순환펌프, 보청기 등

2. 기술문서

Article 7

Obligations of manufacturers

Member States shall ensure that:

- (a) when placing EEE on the market, manufacturers ensure that it has been designed and manufactured in accordance with the requirements set out in Article 4;
- (b) manufacturers draw up the required technical documentation and carry out the internal production control procedure in line with module A of Annex II to Decision No 768/2008/EC or have it carried out;
- (c) where compliance of EEE with the applicable requirements has been demonstrated by the procedure referred to in point (b), manufacturers draw up an EU declaration of conformity and affix the CE marking on the finished product. Where other applicable Union legislation requires the application of a conformity assessment procedure which is at least as stringent, compliance with the requirements of Article 4(1) of this Directive may be demonstrated within the context of that procedure. A single technical documentation may be drawn up;
- (d) manufacturers keep the technical documentation and the EU declaration of conformity for 10 years after the EEE has been placed on the market;

전기, 전자 제품을 시장에 출시할 때 생산자는 제 4조에서 수립된 요구조건에 따라 설계되고 생산되었음을 보증한다.

생산자는 요구되는 기술문서를 작성하고 Decision No 768/2008/EC 의 Annex II 의 모듈 A 를 따르는 내부 설계 절차를 이행한다.

전기,전자제품의 적합성이 (b) 항에서 언급된 절차에 의해 증명된다면 생산자는 EU 자기선언문을 작성하고 완제품에 CE Marking 을 부착해야 한다.

생산자는 제품이 시장에 출시되고 나서 10년 동안 기술문서와 EU 자기 적합성 선언문을 보관한다.

3. 라벨링 (LABELING)

Article 9

Obligations of importers

Member States shall ensure that:

- (a) importers place only EEE that complies with this Directive on the Union market;
- (b) importers, before placing an EEE on the market, ensure that the appropriate conformity assessment procedure has been carried out by the manufacturer, and that they further ensure that the manufacturer has drawn up the technical documentation, that the EEE bears the CE marking and is accompanied by the required documents, and that the manufacturer has complied with the requirements set out in points (f) and (g) of Article 7;
- (c) where an importer considers or has reason to believe that an EEE is not in conformity with Article 4, that importer does not place the EEE on the market until it has been brought into conformity, and that that importer informs the manufacturer and the market surveillance authorities to that effect;
- (d) importers indicate their name, registered trade name or registered trade mark and the address at which they can be contacted on the EEE or, where that is not possible, on its packaging or in a document accompanying the EEE. Where other applicable Union legislation contains provisions for the affixing of the importer's name and address which are at least as stringent, those provisions shall apply;

➤ 수입업자의 책임

EU로 수출되는 전기전자제품에 제조자와 수입자의 정보(이름, Trade mark, 주소)를 제품, 포장재, 동봉되는 문서(예 : 매뉴얼) 중 하나 이상 기재하여야 함

➤ 라벨링 예시

Manufacturer (Hersteller)	Korea Testing Institute 138-7, Sangdaewon-dong, Jungwon-gu, Seongnam-si, Rep. of KOREA 
Importer (Importeur)	TÜV Rheinland UK Limited Vienna House, International Square, Birmingham International Park, Bickenhill Lane, Solihull, West Midlands B37 7GN, UK 

4. 추가 물질 검토

- (10) The measures provided for in this Directive should take into account existing international guidelines and recommendations and should be based on an assessment of available scientific and technical information. The measures are necessary to achieve the chosen level of protection of human health and the environment, with due respect for the precautionary principle, and having regard to the risks which the absence of measures would be likely to create in the Union. The measures should be kept under review and, if necessary, adjusted to take account of available technical and scientific information. The annexes to this Directive should be reviewed periodically to take into account, inter alia, Annexes XIV and XVII to Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and establishing a European Chemicals Agency⁽¹⁾. In particular, the risks to human health and the environment arising from the use of Hexabromocyclododecane (HBCDD), Bis (2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP) and Dibutyl phthalate (DBP) should be considered as a priority. With a view to further restrictions of substances, the Commission should re-investigate the substances that were subject to previous assessments, in accordance with the new criteria set out in this Directive as part of the first review.

- 제한 물질에 대한 검토와 개정(Article 6)

- * 현재 6가지 물질에 대한 변동은 없으나 향후 검토 및 개정에 대하여 언급됨
- * RoHS II 발효 후 3년 이내 우선적으로 REACH SVHC 물질 및 나노 입자에 대한 추가 고려
- * 제한물질의 개정은 2014년 7월 22일 이전에 수행되어야 함
- * 추가 논의 물질 : HBCDD, 프탈레이트 3종 (DEHP, DBP, BBP)

5. 예외사항

4. This Directive does not apply to:
- (a) equipment which is necessary for the protection of the essential interests of the security of Member States, including arms, munitions and war material intended for specifically military purposes;
 - (b) equipment designed to be sent into space;
 - (c) equipment which is specifically designed, and is to be installed, as part of another type of equipment that is excluded or does not fall within the scope of this Directive, which can fulfil its function only if it is part of that equipment, and which can be replaced only by the same specifically designed equipment;
 - (d) large-scale stationary industrial tools;
 - (e) large-scale fixed installations;
 - (f) means of transport for persons or goods, excluding electric two-wheel vehicles which are not type-approved;
 - (g) non-road mobile machinery made available exclusively for professional use;
 - (h) active implantable medical devices;
 - (i) photovoltaic panels intended to be used in a system that is designed, assembled and installed by professionals for permanent use at a defined location to produce energy from solar light for public, commercial, industrial and residential applications;
 - (j) equipment specifically designed solely for the purposes of research and development only made available on a business-to-business basis.

RoHS II 적용 예외 제품

1. 군사용으로 의도된 무기, 군수물자 등
2. 우주로 보내기 위해 의도된 제품
3. 움직이지 않는 대형 설비
4. 대형 고정 장치
5. 전문적인 용도로 이용할 수 있는 기기
6. 이식 의료 장비

RoHS II 내용

6. 예외조항(1)

Exemption	
6(a)	Lead as an alloying element in steel for machining purposes and in galvanised steel containing up to 0,35 % lead by weight
6(b)	Lead as an alloying element in aluminium containing up to 0,4 % lead by weight
6(c)	Copper alloy containing up to 4 % lead by weight
7(a)	Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead)
7(b)	Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission, and network management for telecommunications
7(c)-I	Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix

RoHS 예외 조항

- RoHS의 제한물질이 정해진 기준치를 초과하더라도 사용이 인정되는 내용을 예외조항이라고 함.
- 예를 들어 구리합금에 대하여 납(Pb)의 정밀 분석 결과가 32,000 mg/kg으로 검출 되었다고 가정하였을 때, 원문의 내용과 같이 구리 합금은 4%까지 인정되므로 납 사용이 가능함.

6. 예외조항(2)

ANNEX IV

Applications exempted from the restriction in Article 4(1) specific to medical devices and monitoring and control instruments

Equipment utilising or detecting ionising radiation

1. Lead, cadmium and mercury in detectors for ionising radiation.
2. Lead bearings in X-ray tubes.
3. Lead in electromagnetic radiation amplification devices: micro-channel plate and capillary plate.
4. Lead in glass frit of X-ray tubes and image intensifiers and lead in glass frit binder for assembly of gas lasers and for vacuum tubes that convert electromagnetic radiation into electrons.
5. Lead in shielding for ionising radiation.
6. Lead in X-ray test objects.
7. Lead stearate X-ray diffraction crystals.
8. Radioactive cadmium isotope source for portable X-ray fluorescence spectrometers.

Article 5

Adaptation of the Annexes to scientific and technical progress

2. Measures adopted in accordance with point (a) of paragraph 1 shall, for categories 1 to 7, 10 and 11 of Annex I, have a validity period of up to 5 years and, for categories 8 and 9 of Annex I, a validity period of up to 7 years. The validity periods are to be decided on a case-by-case basis and may be renewed.

For the exemptions listed in Annex III as at 21 July 2011, the maximum validity period, which may be renewed, shall, for categories 1 to 7 and 10 of Annex I, be 5 years from 21 July 2011 and, for categories 8 and 9 of Annex I, 7 years from the relevant dates laid down in Article 4(3), unless a shorter period is specified.

For the exemptions listed in Annex IV as at 21 July 2011, the maximum validity period, which may be renewed, shall be 7 years from the relevant dates laid down in Article 4(3), unless a shorter period is specified.

의료기기의 예외조항은 일반 대형, 소형 가전의 제품과 차이가 있어 Annex IV 에 예외조항이 있음

RoHS의 예외조항은 법안발표일을 기점으로 적용되며, 2011년 7월 21일로 부터 최대 7년임

RoHS II 내용

7. 예비부품 RoHS 적용?

Article 4

예비 부품 적용 유무

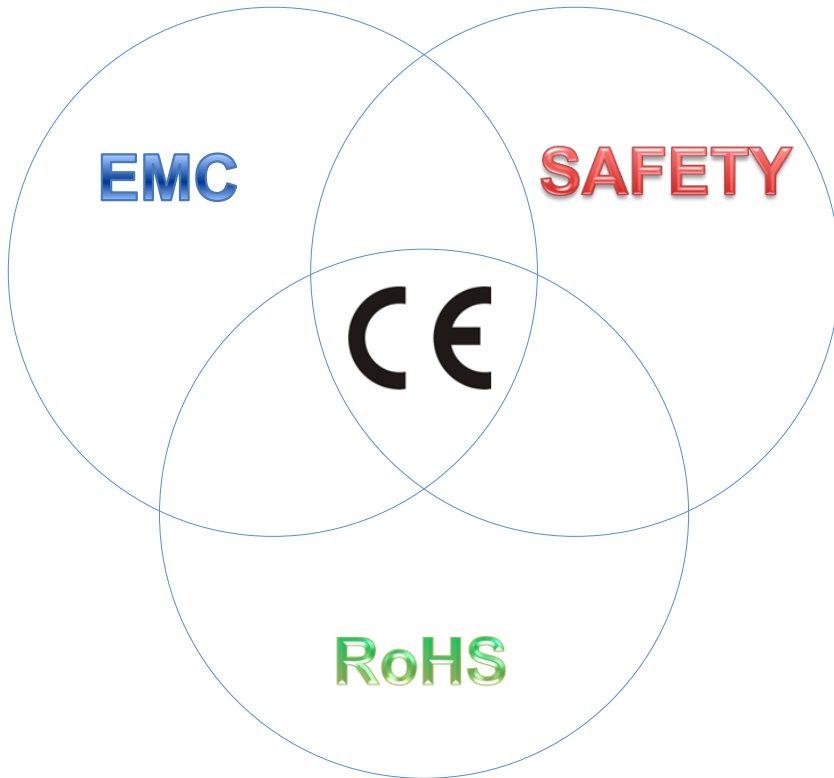
ANNEX II

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- Restricted substances referred to in Article 4(1) and maximum concentration values tolerated by weight in homogeneous materials
- Lead (0,1 %)
- Mercury (0,1 %)
- Cadmium (0,01 %)
- Hexavalent chromium (0,1 %)
- Polybrominated biphenyls (PBB) (0,1 %)
- Polybrominated diphenyl ethers (PBDE) (0,1 %)

케이블
기, 전자
지 않음

(2) OJ L 189, 20.7.1990, p. 17.

RoHS II 내용



➤ RoHS II 주요사항

1. 대상제품의 범위 확대
2. 기술문서 작성
3. 이행 주체의 정의(생산자)
4. 라벨링(Labeling)
5. 자기 적합성 선언
6. 제한물질 검토

RoHS II 대응 방안

1. RoHS 단속의 첫 단계는 XRF Screening 으로 시작됨.



업체명	발생시점	규제 법규	규제물질 및 기준	피해금액	결과
SONY (Play station)	2001.10	네덜란드 Cd Decree 1999	Cd 100 mg/kg이하	매출손실 -130억엔 영업이익손실 -60억 엔	출하금지 적합품 교환
COMPAQ (PC)	1999	스웨덴 조달청 계약조건 할로겐 난연제 사용금지	할로겐 난연제 불검출	5,000만 달러	공급계약 파기
DYSON (청소기)	1998	스위스/독일 국가 규정	Cd 100 mg/kg이하	출하금지	시장진출포기

RoHS II 대응 방안

3. 기술 문서(Technical Document) 준비

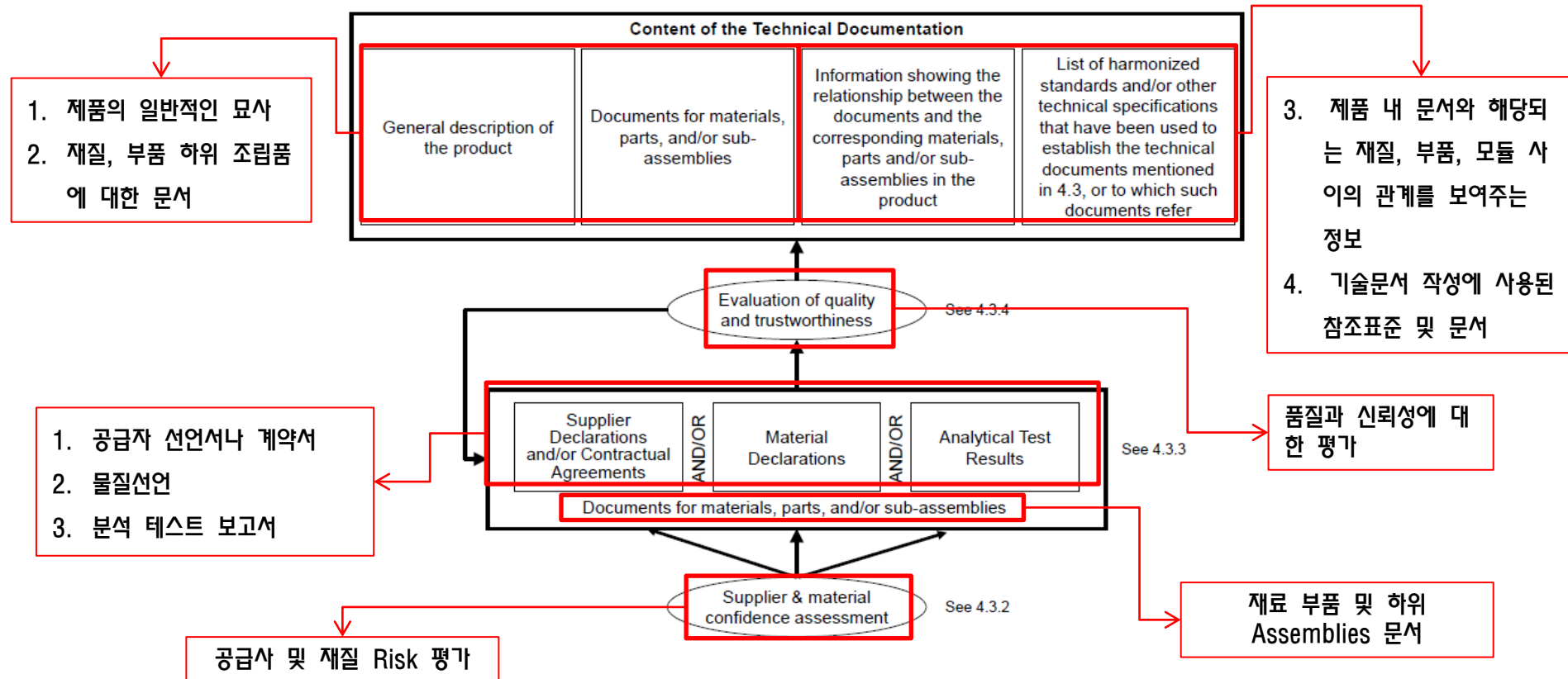
- 1) 제조자 정보
- 2) 판매된 제품 혹은 브랜드
- 3) RoHS 예외조항에 대한 정확한 파악 (허용농도 및 대상 제품군)
- 4) 내부적인 RoHS 대응 프로세스 구축
- 5) 인증서 (ISO 혹은 3자 분석기관 제품 인증서)
- 6) 각 제품 혹은 부품에 대한 자가선언문(DoC_Declaration of Conformity)
- 7) BoM 관리 및 LOT별 관리 철저

4. 물리적인 관리

- 1) 입고되는 자재, 출고되는 제품에 대한 XRF Screening 진행
- 2) 3자 공인분석기관을 통한 검증자료 구비

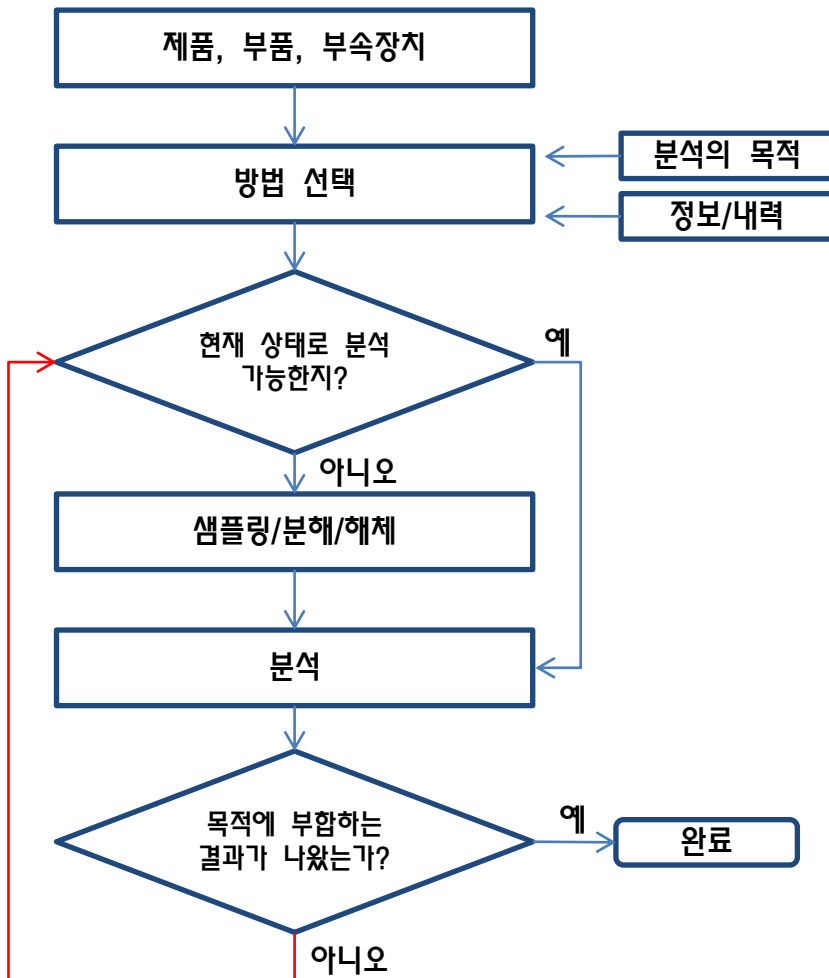
RoHS II 대응 방안

1. 기술문서 작성 절차 (EN 50581)



RoHS II 대응 방안

1-1. 샘플링을 위한 절차



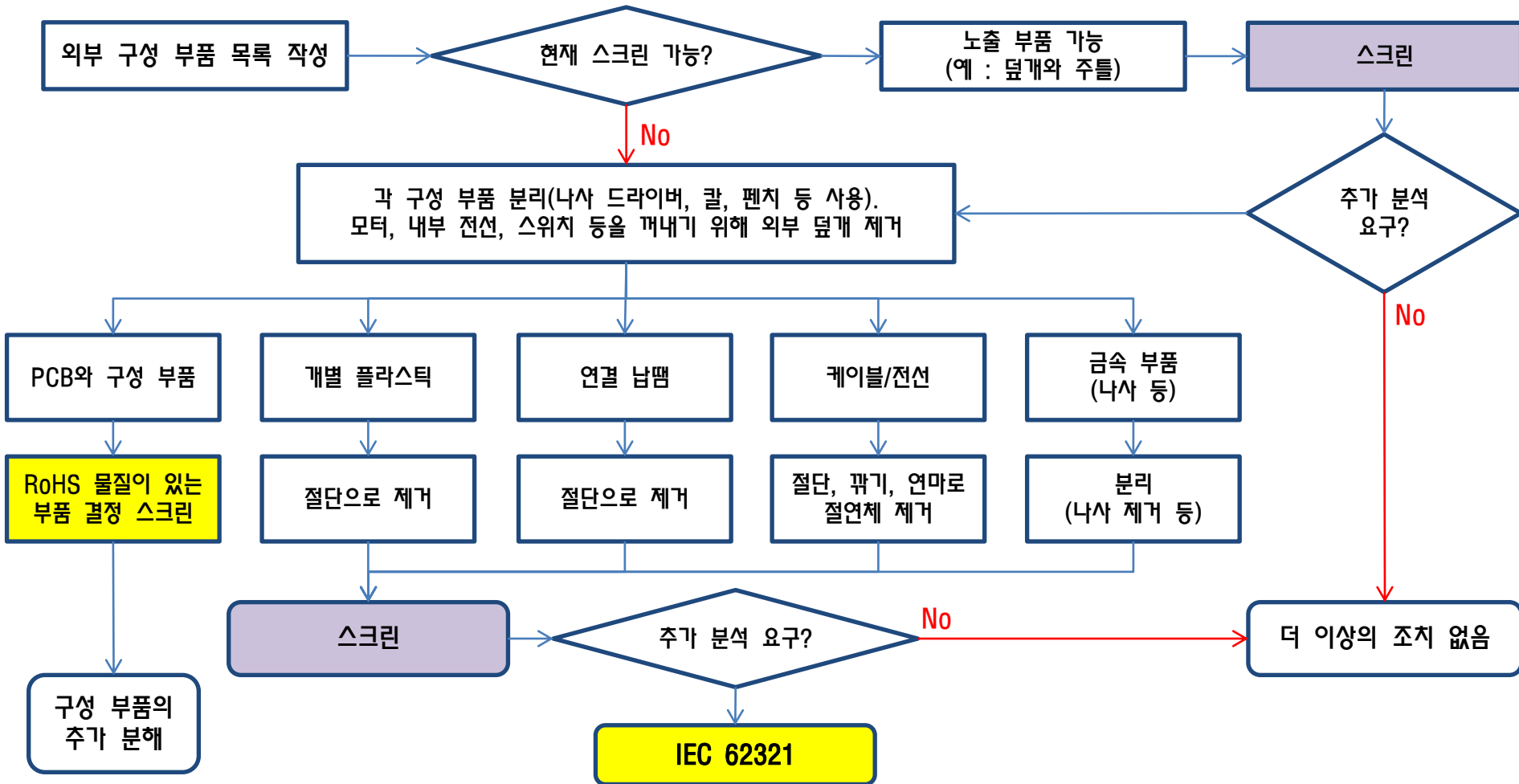
➢ “균질 물질”은 기계적인 행위, 풀기, 자르기, 압착, 연마와 같은 행위에 의해서 다른 물질로 분해 또는 분리될 수 없는 균일한 조성된 하나의 물질을 의미

➢ 소형부품

소량의 물질로부터 측정을 위한 샘플링을 하는 것은 어려움.
표면에 고정된 장치(SMD)와 같은 부품은 크기가 작아서 일반적인 도구들로는 분해나 해체가 어려우며, 샘플의 양이 너무 적어서 적절한 분석을 하기에 필요한 양을 만족시키기 어려움.

RoHS II 대응 방안

1-2. 샘플링 예 (선풍기)



RoHS II 대응 방안

1-3. 재질, 부품, 하위조립품 내에 제한된 물질의 존재 개연성

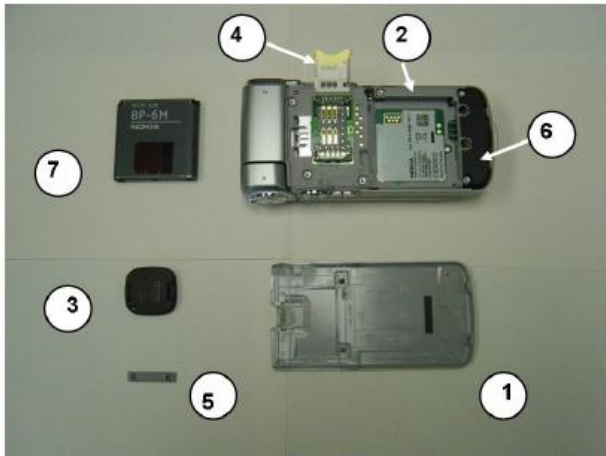


그림 3 - 배터리와 뒤 덮개가 분리된 휴대폰

표 1 - 휴대폰에서 가능한 규제 또는 스크리닝 물질

샘플 번호	소자/조립부품	구성성분	존재 확률 ^a	규제물질 관련 원소 ^b	분석 선택
1	플라스틱 뒤 덮개	폴리머	Moderate	Pb, Br	4.3 참조
2	플라스틱 폰 덮개	폴리머	Moderate	Pb, Br	4.3 참조
3	플라스틱 렌즈 덮개	폴리머	Moderate	Pb	4.3 참조
4	SIM 카드 금속 클립	폴리머	Low	Cr, Cd	4.3 참조
5	컴포트 덮개	폴리머	Moderate	Pb, Br	4.3 참조
6	본체의 플라스틱 부분	폴리머	Moderate	Pb, Br	4.3 참조
7	배터리	complex	High?	(Cd, Pb, Hg)	4.3 참조

^a 존재 확률은 제시된 규제물질의 발견 가능성 표시

^b 브로민은 규제된 브로민화 난연재의 사용으로 표시될 수 있다.



그림 4 - (B형) 휴대폰의 주 구성부품으로 부분분리

표 2 - 휴대폰 주 구성부품에서 가능한 규제물질들

샘플 번호	소자/조립부품	구성성분	존재 확률 ^a	규제물질 관련 원소 ^b	분석 선택
1	TFT 화면	폴리머/유리/금속	Moderate	Pb	추가 분리/분해 이후
2	키패드	폴리머	High	Cd, Hg	추가 분리 필요
3	밀 덮개	폴리머	High	Cd, Br	Yes
4	기타 덮개/틀	폴리머	High	Cd, Br	Yes
5	PWBs 본체	다양(섬유 유리, 구리)	High	Pb, Br, Hg	추가 분리/분해 이후

^a 존재 확률은 제시된 규제물질의 발견 가능성 표시

^b 브로민은 규제된 브로민화 난연재의 사용으로 표시될 수 있다.

RoHS II 대응 방안

2-1. 협력사 평가

필수	유해물질 관리	협력업체에서 제공하는 데이터를 검증하고 있는가?
필수		유해물질관련 데이터를 균질 재질별로 관리하고 제공할 수 있는가?
필수		유해물질 부 적합품이 발생되었을 경우 원인을 파악하고 적절하게 대책을 수립하여 실시하고 있는가?
필수		변경 점 발생시 유해물질정보를 확인하고 관리기준에 만족하는지 검증하고 있는가?

선택		임직원에게 제품환경규제 교육을 계획대로 실시하고 있는가?			
필수		협력업체에서 제공하는 데이터를 검증하고 있는가?			
필수	유해물질 관리	유해물질관련 데이터를 균질 재질별로 관리하고 제공할 수 있는가?			
필수		유해물질 부 적합품이 발생되었을 경우 원인을 파악하고 적절하게 대책을 수립하여 실시하고 있는가?			
필수		변경 점 발생시 유해물질정보를 확인하고 관리기준에 만족하는지 검증하고 있는가?			
선택		공정에서 유해물질을 혼용해서 사용될 경우 유해물질이 오염되지 않도록 관리하고 있는가?			
선택	제품/재료 관리	유해물질을 포함한 자재는 별도로 관리하고 있는가?			
선택		입고/출하검사기준에 따라 유해물질검사를 실시하고 있는가?			
필수		제품을 출하할 경우 고객이 요구하는 모든 데이터를 제공하고 있는가?			
평가의견			신뢰도 등급		
			H	M	L

부적합개수 (0 ~ 2) : L, 부적합 개수 (3 ~ 5) : M, 부적합 개수 (6이상) : H

● 주요항목(필수)에 대한 부적합이 있을 경우 H 등급으로 지정가능

2. 평가 Checklist

구분	No.	평가항목	평가 결과(Y/N)	
			예(Y)	아니오(N)
1. 환경경영시스템	1.1	환경관리 인력 및 조직이 있고 책임자의 책임, 권한, 역할이 명확하게 규정되어 있는가?		
	1.2	서명 날인한 친환경 자재공급계약서 및 공인기관 시험성적서 등의 친환경 서류를 모두 제출하였는가?		
	1.3	환경법규, 규제 및 고객사 요구사항 변경 시 유해물질 관리 목록상에 반영하여 개정 하고 있는가?		
	1.4	내부감사에 결과에 따른 시정조치 이행 및 효과가 확인되고 있는가?		
	1.5	사내, 국내외 영업거점 및 공장, 계열사에 대해 환경관련 물질에 대한 정보 전달, 관리 지침이 공유되고 있는가?		
2. 협력업체 관리	2.1	신규공급업체 선정 기준이 명확하고 유해물질 관리기준을 만족하는 업체를 선정하고 있는가?		
	2.2	의 유해물질 관리 기준을 협력업체와 공유하고 있는가?		
	2.3	성분조성표 및 유해물질에 대한 공인기관 시험 성적서를 협력업체로부터 입수하여 관리하고 있는가?		
3. 공정 관리	3.1	구매 원재료, 부품에 대한 유해물질 검사 표준이 있으며 검사표준에 따라 이행되고 있는가?		
	3.2	최종 완제품에 대한 유해물질 함유여부를 주, 소, 분산성기관에 의뢰하여 검증하고 있는가?		
	3.3	사업장 내에서 사용하는 전 원자재, 부자재, 부품은 RoHS-Free가 되어 있는가?		

환경관리 인력 및 조직이 있고 책임자의 책임, 권한, 역할이 명확하게 규정되어 있는가?

서명 날인한 친환경 자재공급계약서 및 공인기관 시험성적서 등의 친환경 서류를 모두 제출하였는가?

환경법규, 규제 및 고객사 요구사항 변경 시 유해물질 관리 목록상에 반영하여 개정 하고 있는가?

* 한국전자정보통신진흥회 기술문서 지침 가이드 내용 중 일부분 발췌

2-2. 위험성 평가 (IEC/PAS 62596)

(1) 제출된 BOM 과 조립도 및 문서 검토를 통하여 재질/부품 선택

기준 : “Probability of Presence of Restricted Substances tables.”

(제한 물질 존재 가능성에 대한 도표를 통하여 부품/재질 선택)

- IEC/PAS 62596 의 지침에는 모든 재질에 대해 언급되어있지 않다.

RoHS II 문서 검토(8)

✓ IEC/PAS 62596 에 의거 제품이 포함될 가능성이 높은 재질(1)

APPENDIX A. Material confidence assessment (IEC/PAS 62596)⁴⁾

Components/ ⁴⁾ Materials ⁴⁾	Restricted Substances ⁴⁾						Number of homogeneous materials ⁴⁾	Remarks ⁴⁾
	Hg ⁴⁾	Cd ⁴⁾	Pb ⁴⁾	Cr(VI) ⁴⁾	PBBs ⁴⁾	PBDEs ⁴⁾		
Materials ⁴⁾								
Paint, ink & similar coating ⁴⁾	L ⁴⁾	H ⁴⁾	H ⁴⁾	M ⁴⁾	L ⁴⁾	L ⁴⁾	1 ⁴⁾	4)
Adhesive ⁴⁾	4)	4)	M ⁴⁾	4)	M ⁴⁾	M ⁴⁾	1 ⁴⁾	4)
Polyurethane – high gloss ⁴⁾	H ⁴⁾	M ⁴⁾	M ⁴⁾	L ⁴⁾	L ⁴⁾	M ⁴⁾	>1 ⁴⁾	4)
Polyvinyl chloride (PVC) ⁴⁾	L ⁴⁾	H ⁴⁾	H ⁴⁾	M ⁴⁾	L ⁴⁾	M ⁴⁾	1 ⁴⁾	4)
Styrene, polystyrene (HI-PS), ABS, polyethylene (PE), polyester ⁴⁾	L ⁴⁾	M ⁴⁾	M ⁴⁾	L ⁴⁾	L ⁴⁾	H ⁴⁾	1 ⁴⁾	4)
Rubber ⁴⁾	L ⁴⁾	M ⁴⁾	M ⁴⁾	L ⁴⁾	L ⁴⁾	M ⁴⁾	1 ⁴⁾	4)
Plastics – other ⁴⁾	L ⁴⁾	M ⁴⁾	M ⁴⁾	L ⁴⁾	L ⁴⁾	M ⁴⁾	1 ⁴⁾	4)
Colorants (all plastics) red, orange, yellow, pink, green ⁴⁾	M ⁴⁾	H ⁴⁾	H ⁴⁾	H ⁴⁾	N/A ⁴⁾	N/A ⁴⁾	1 ⁴⁾	4)
Metal ⁴⁾	L ⁴⁾	M ⁴⁾	H ⁴⁾	H ⁴⁾	N/A ⁴⁾	N/A ⁴⁾	1 & >1 ⁴⁾	4)
Steel – other ⁴⁾	L ⁴⁾	L ⁴⁾	L ⁴⁾	H ⁴⁾	N/A ⁴⁾	N/A ⁴⁾	1 ⁴⁾	4)
Steel – free- machining ⁴⁾	L ⁴⁾	L ⁴⁾	H ⁴⁾	L ⁴⁾	N/A ⁴⁾	N/A ⁴⁾	1 ⁴⁾	4)
Copper alloy ⁴⁾	L ⁴⁾	H ⁴⁾	H ⁴⁾	L ⁴⁾	N/A ⁴⁾	N/A ⁴⁾	1 ⁴⁾	Pb in metal could be exempt ⁴⁾

L = low probability

M = medium probability

H = high probability

N/A = not applicable

상, 중, 하 등급에 따른 위험성 확인

RoHS II 문서 검토(8)

✓ IEC/PAS 62596 에 의거 제품이 포함될 가능성이 높은 재질(2)

구성부품/물질	규제물질 ^a						균일한 물질의 수 ^b	주의
	Hg	Cd	Pb	Cr(VI)	PBBs	PBDEs		
Printed Wiring Board (PWB)								
PWB 물질/전구	L	L	L	L	L	N/A	>1	
연결 장치	M	L	H	L	L	H	>1	
축전기-전해 타입	L	M	H	L	L	M	>1	
축전기-칩 타입	L	M	M	L	L	M	>1	
저항 장치-IMT 타입	L	M	H	L	L	L	>1	
저항 장치-칩 타입	L	H	M	L	L	L	>1	
다이오드e	L	M	M	L	L	L	>1	
퓨즈	L	M	H	L	L	L	>1	
납땜(process & handsoldering)	L	M	H	L	N/A	N/A	1	
접착제(Red & White)	L	L	M	L	M	M	1	구성부품 고정에 사용
구성부품 발단 코팅	L	H	H	L	N/A	N/A	1 & >1	
구성부품 물딩	L	L	L	L	L	H	1 & >1	
집적회로(IC) & BGAs	L	L	H	L	L	H	>1	
계전기-수은	H	L	M	L	L	L	>1	
계전기-전자기	L	H	M	L	L	L	>1	
스위치-수은	H	L	M	L	L	L	>1	
스위치-기계식	M	H	M	L	L	L	>1	
자동 온도 조절 장치	H	M	M	L	L	L	>1	
불꽃 센서	H	M	M	L	L	L	>1	
열 이미지 반도체	H	M	M	L	L	L	>1	
변환기(LOT)	L	M	H	L	L	M	>1	
부속품								
리모컨	L	H	H	L	L	L	>1	
외부 케이블(e.g. Scart, USB, cinch)	L	H	H	L	L	L	>1	
외부 전원 공급기	L	H	H	L	L	M	>1	
물질								
레이터 잉크, 도금 코팅	L	H	H	M	L	L	1	

L = 낮은 가능성

M = 중간 가능성

H = 높은 가능성

N/A = 적용 없음

물질을 고른 화학적 구성에 따라 정의함

1 = 한 가지 물질이 사용됨

>1 = 둘 이상이 사용됨

U = 알 수 없음

3. 문서 검토

(1) 문서 검토 기준

- 재질 / 부품의 DoC
- 재질 / 부품과 관련된 분석 리포트
- 물질 선언서

(2) 요구사항

- a. 위와 대응하는 선정된 재질/부품
- b. 분석 리포트는 ISO/IEC 17025:2005 최근에 인정받은 분석기관으로부터 발행 되어야 함
- c. 분석 리포트는 6개의 RoHS 화학물질을 포함하고 있는 부품에 대하여 반드시 보여져야 함
(예외 사항 있음)

3-1. 문서 검토 (DoC)

- (1) 번호 (EEE의 고유 식별 번호)
- (2) 생산자 또는 대리인의 이름과 주소
- (3) 적합성 선언문의 책임
- (4) 선언의 목적
- (5) RoHS Directive (2011/65/EU) 적합함 언급
- (6) 사용된 규격과 적합성 선언에 관련된 참조 문서
- (7) 부가적인 정보
- (8) 발급한 날짜 및 서명(우측 가장자리)

3-2. 문서 검토 (분석 보고서 – Test Report)

- (1) 분석을 실시한 분석실 이름, 주소 및 위치 설명
- (2) 샘플 접수 및 분석 시행 일자
- (3) 보고서 식별 번호(일련번호) 및 보고서의 총 페이지 번호
- (4) 공급자명, 부품 번호, 배치 코드, 일자 코드 및 기타 고유 마킹과 같은 식별 정보
- (5) 분석하는 물질
- (6) 사용된 표준 및 샘플 준비 방법 및 분석검사 방법
- (7) 검출 한계(Limit Of Detection : LOD) 및 정량 한계(Limit Of Quantification : LOQ)
- (8) 분석 결과 (측정 단위)
- (9) 분석 결과에 영향을 줄 수 있는 샘플 준비 및 분석 절차에 관한 내용
- (10) 분석 책임자 이름과 서명

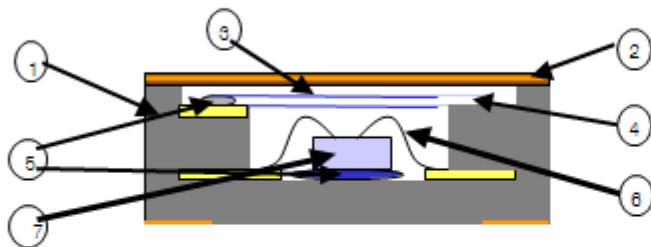
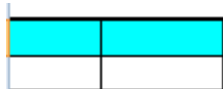
RoHS II 대응 방안

3-3. BOM(Bill of Material) 관리 예

Component part No. / Coway or Supplier	component Name	Fragment No.	ED-XRF	Test Date	RoHS	Test Date	ED-XRF & RoHS					PAHs/ Phthalates/ Azo Dyes/ Formaldehyde	Test Date	Test Result	Remark
							Od	Pb	Hg	Cr	Br				
PACKING BOX-PRODUCT	1212889	1	RT11R-84997-001	2011-12-28			0	7	0	4	14				
PACKING CUSHION-LOWER	1211679	2	RT11R-84997-002	2011-12-28	RT11R-84997-002-E	2012-01-06	12	0	0	0	ND				
COVER-FRONT	9211486	8-1	RT11R-84997-003	2011-12-28			0	0	0	0	1	RT11R-86086-001-E	2012-01-06	ND	
COVER-FRONT	9211486	8-2	RT11R-84997-004	2011-12-28			8	0	0	0	0				
STICKER-FILTER REPLACEMENT	9210664	8-8-1	RT11R-84997-006	2011-12-28			4	2	0	0	0	RT11R-86086-004-E	2012-01-06	Formaldehyde: 46ppm The other item: ND	Formaldehyde is ok
STICKER-FILTER REPLACEMENT	9210664	8-8-2	RT11R-84997-008	2011-12-28			26	4	2	0	0				
STICKER-FILTER REPLACEMENT	9210664	8-8-3	RT11R-84997-007	2011-12-28			88	4	0	0	0				
BRACKET-MAGNET	1001824	8-4	RT11R-84997-008	2011-12-28	RT11R-84997-008-E	2012-01-06	0	0	0	Negative	28				
SCREW	1006126	8-6	RT11R-84997-009	2011-12-28			0	0	0	79	10				
RPE-FILTER	1211676	4-1	RT11R-84997-010	2011-12-28	RT11R-84997-010-E	2012-01-06	10	12	0	62	ND	RT11R-86086-006-E	2012-01-06	ND	
RPE-FILTER	1211676	4-2	RT11R-84997-011	2011-12-28			0	8	4	8	0	RT11R-86086-006-E	2012-01-06	ND	
CASE-OPTION FILTER		6-1	RT11R-84997-012	2011-12-28			11	0	0	0	46	RT11R-86086-007-E	2012-01-06	ND	
DEODORIZATION FILTER-MEDIUM		6-2	RT11R-84997-013	2011-12-28			18	2	6	0	2				
DEODORIZATION FILTER-MEDIUM		6-3	RT11R-84997-014	2011-12-28			0	2	0	4	79	RT11R-86086-008-E	2012-01-06	ND	
Filter Packing	-	6-1	RT11R-84997-016	2011-12-28			86	0	0	0	0				
Hepa MEDIA		6-2	RT11R-84997-016	2011-12-28			8	0	1	1	7	RT11R-86086-008-E	2012-01-06	ND	
PU Foam		6-3	RT11R-84997-017	2011-12-28			21	0	0	1	8	RT11R-86086-011-E	2012-01-06	ND	
Frame		6-4	RT11R-84997-018	2011-12-28			0	0	0	0	0	RT11R-86086-010-E	2012-01-06	ND	
Ink		6-6	RT11R-84997-019	2011-12-28			0	2	0	0	820				
GUIDE-FILTER	9211487	7-1	RT11R-84997-020	2011-12-28			0	1	1	2	0				
COVER-LENS	9210641	7-2	RT11R-84997-021	2011-12-28	RT11R-84997-021-E	2012-01-06	0	0	1	26	ND	RT11R-86086-002-E	2012-01-06	ND	

RoHS II 대응 방안

3-4. BOM(Bill of Material) 관리 예



ROHS

품명	중금속		소재사 no	DATE	분석 결과	재질 종류	제조 일자	검수	비고	유효일자
	Br	Cl								
소재명	42	208	20014-08-02	2008-08-21	INTERTEK	×				2008-08-21
1) PACKAGE	N.D	N.D	CE/2007/84747	2007-11-28	888	×				2008-11-28
7) IC	N.D	N.D	CE/2008/88786	2008-08-02	888	×				2008-08-02
8) GOLD WIRE	N.D	N.D	CE/2008/11718E	2008-01-15	888	×				2008-01-14
4) BLANK						×				
8) SILVER						×				
6) ADHESION						×				
2) LID	N.D	N.D	AYAA08-128880	2008-04-30	888	×				2008-04-30

★ PFOS, SVHC 등 물질은 존재하지 않으며, 해당사항 없음.

구분	주요 성분								주요 성분 상세 정보													
	품명	소재	재질	중금속 (g/g)	%	제조 업체명	소재 종류	수량	8대 중금속 함유량						소재 사명	CAS NO	소재사 NO	DATE	ICP 분석	제조 일자	ICP DATA	MSDS DATA
									Pb	Cd	Hg	Cr6+	PBB	PBDE								
SMD QBC	소재명			0.108					N.D	N.D	N.D	N.D	N.D	N.D			RYOTR021-001	2008-08-10	INTERTEK			
	1) PACKAGE	BP-001	Al2O3	0.147	78.04	KYOCERA	*	1	N.D	N.D	N.D	N.D	N.D	N.D	*	1844-28-1	80893-07-ATJ	2007-12-28	KYOCERA			
	7) IC	BP-002	Si	0.00081	0.17	NPC	*	1	N.D	N.D	N.D	N.D	N.D	N.D	*	7428-98-6	08/2007/AB741	2007-11-07	888			
	8) GOLD WIRE	BP-003	GOLD	0.001	0.64	MK전자	*	2	N.D	N.D	N.D	N.D	N.D	N.D	*	7440-57-5	08/2008/11718E	2008-01-15	888			
	4) BLANK	BP-004	SiO2	0.002882	1.84	가람전자	*	2	N.D	N.D	N.D	N.D	*	*	*	14808-80-7	8105106068	2008-07-24	888			
	8) SILVER	BP-005	Ag	0.000001	0.00	유일물산	*	1	N.D	N.D	N.D	N.D	*	*	*	7440-22-4	0784V408-07218	2008-08-12	888			
	6) ADHESION	BP-006	Ag	0.00018	0.10	3M 코트	*	1	N.D	N.D	N.D	N.D	N.D	N.D	*	7440-22-4	0784V407-27788	2007-12-18	888			
	2) LID	BP-007	NI	0.085	10.82	한국금속소재	NI	2	N.D	N.D	N.D	N.D	N.D	N.D	한국금속소재	7438-98-8	AYAA08-128870	2008-04-30	888			

Global Business Partner

RoHS II 대응 방안

3-4. KOLAS (Certificate of accreditation)



No.003 (1/38)

CERTIFICATE OF ACCREDITATION

Name of Laboratory : KOTITI Testing & Research Institute

Representative : Kim, Jung-Soo

Address of Headquarters : 111, Sagimakgol-ro, Jungwon-gu, Seongnam-si, Gyeonggi-do, 462-807, Korea

Address of Laboratory : 111, Sagimakgol-ro, Jungwon-gu, Seongnam-si, Gyeonggi-do, 462-807, Korea

Duration : January 19, 2011 ~ January 18, 2015


Scope of Accreditation
(Scope of Accreditation is described in the accompanying Annex)

This testing laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025 : 2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).

June 20, 2013

Seong Si-heon

Administrator,
Korea Laboratory Accreditation Scheme(KOLAS)



No.003 (22/38)

2. Chemical Test

0225 Other Environment

Test method	Standard designation	Test range or Detection limit
ASTM E 1613-12	Standard Test Method for Determination of Lead by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES), Flame Atomic Absorption Spectrometry (FAAS), or Graphite Furnace Atomic Absorption Spectrometry (GFAAS) Techniques	10 mg/kg
ASTM E 1645-01(2007)	Standard Practice for Preparation of Dried Paint Samples by Hoplate or Microwave Digestion for Subsequent Lead Analysis	10 mg/kg
AOAC Official Method 974.02:1976	Lead in Paint, Atomic Absorption Spectrophotometric Method.	10 mg/kg
16 CFR 1303:2013	BAN OF LEAD-CONTAINING PAINT AND CERTAIN CONSUMER PRODUCTS BEARING LEAD-CONTAINING	10 mg/kg
KS C IEC 62321:2009	Electrotechnical products - Determination of levels of six regulated substances(lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, polybrominated diphenyl ethers)	10 mg/kg

0226 Textiles

Test method	Standard designation	Test range or Detection limit
KS K 0210:2007	Test methods for quantitative analysis of fibre mixtures of textiles - Test methods for quantitative analysis of fibre mixtures	0.1 %
KS K 0210-1:2008	Test methods for quantitative analysis of fibre mixtures of textiles - Test methods for fibre identification	Fiber Analysis
CAN/CSB-4.2 No. 14-2005	Textile Test Methods - Quantitative Analysis of Fibre Mixtures	0.1 %
AS 2001.7-2005	Methods of test for textiles - Quantitative analysis of fibre mixtures (BS4407:1988, MOD)	0.1 %
DIN 54200:1974	Testing of textiles ; quantitative analysis of fibre mixtures by means of solvent method ; basis and field of application	0.1 %
DIN 54201:1975	Testing of textiles ; quantitative analysis of fibre mixtures, directions for the work	0.1 %
AATCC 20-2011	Fiber Analysis : Qualitative	Fiber Analysis
BS ISO 4407:1988	Method for quantitative analysis of fibre mixtures	0.1 %
ISO 1833:1977/Amd 1:1980	Textiles - Binary fibre mixtures - Quantitative chemical analysis	0.1 %
JIS L 1030-1:2012	Testing methods for quantitative analysis of fibre mixtures - Part 1 : Testing methods for fiber identification	0.1 %
JIS L 1030-2:2012	Testing methods for quantitative analysis of fibre mixtures - Part 2 : Testing methods for quantitative analysis of fibre mixtures	0.1 %

RoHS II 대응 방안

3-5. KOLAS 기관 확인



The image shows the KOLAS (Korea Laboratory Accreditation Scheme) homepage. The header includes the KOLAS logo and navigation links like Home, 로그인, 회원가입, etc. The main content area features a large banner for '교정기관' (Calibration Laboratories) with a man in a suit. A sidebar on the left lists various accreditation categories like 시험기관, 검사기관, etc. A '공지사항' (Notice) section is at the bottom.



This image shows the KOLAS search interface. It includes a search bar with filters for '인증분야' (Certification Field), '세부분야' (Sub-field), '규격번호' (Standard Number), '시도명' (Province Name), and '기관명' (Institution Name). Below the search bar, there's a 'tip' section and a '검색결과' (Search Results) table. The table has columns for '인증번호' (Certification Number), '기관명' (Institution Name), '공인유효기간' (Valid Period), '시도' (Province), and '공인인증서 사본' (Certification Copy). The first result is highlighted with a red box.

인증번호	기관명	공인유효기간	시도	공인인증서 사본
KT003	사단법인 KOTITI 시험연구원	2011-01-19 ~ 2015-01-18	경기	

3-6. 위변조 성적서 확인

귀사(貴社)가 보유하신 SGS정적서의 진위여부를 확인하시려면, 아래 3개의 입력란에 성적서 관련 정보를 입력하시면 확인하실 수 있습니다.

[illegible]

■ 현재 한국 외에 구체적인 자료가 없지만, 추후에 다른 연구기관의 성적서 정보를 공유해드리겠습니다.

대만 RSTS DB 성적서 검색

단, Download 는 불가능하며, 열람만 가능함.

4. 선정된 재질/부품은 ED-XRF 및 정밀 분석 진행

요구사항

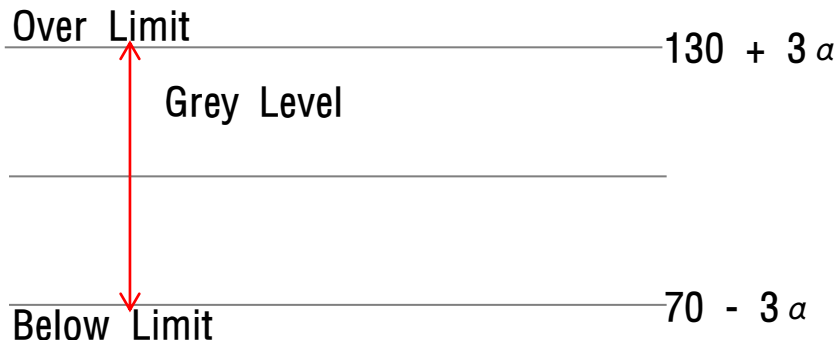
- a. IEC/PAS 62596 에 의거 재질평가 및 문서 평가를 통해 대상 부품 선정
- b. BOM 상에 나타나지 않은 추가적인 고 위험성의 재료들 또한 분석 대상에 포함 될 수 있음
- c. 선정된 부품은 먼저 ED-XRF 분석 진행
- d. ED-XRF 결과가 기준치를 초과하였을 경우, 정밀 분석이 진행됨

RoHS II 대응 방안

5. ED-XRF 판단 기준 (IEC 62321-3-1)

Element	Polymers	Metals	Composite material
Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$LOD < X < (150+3\sigma) \leq OL$
Pb	$BL \leq (700-3\sigma) < X < (1\ 300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1\ 300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1\ 500+3\sigma) \leq OL$
Hg	$BL \leq (700-3\sigma) < X < (1\ 300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1\ 300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1\ 500+3\sigma) \leq OL$
Br	$BL \leq (300-3\sigma) < X$		$BL \leq (250-3\sigma) < X$
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$

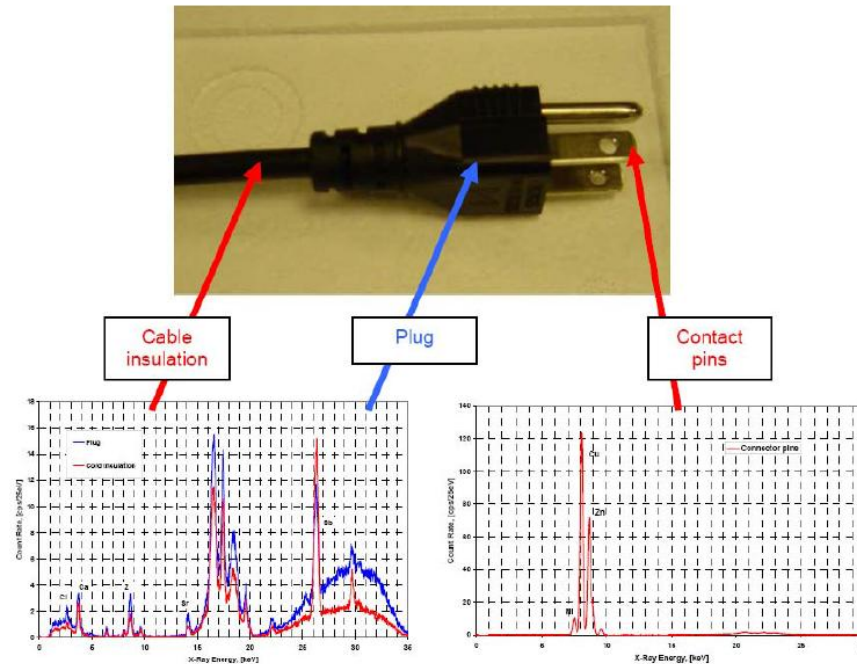
예) ED-XRF Cd 기준



RoHS 에서 Cd 의 규제 기준치는 0.01% (100 mg/kg) 이며, ED-XRF 장비의 특성 상 오차를 감안하여 약 30%를 기준으로 함.

RoHS II 대응 방안

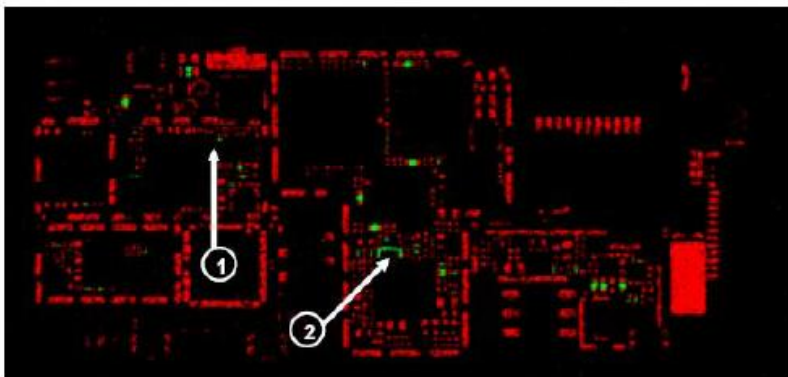
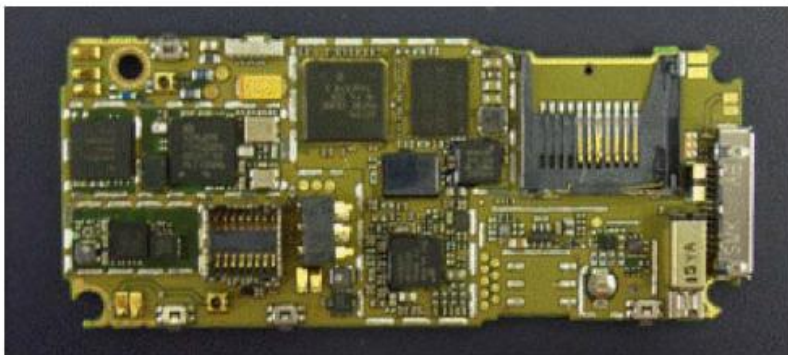
6-1. XRF Screening Test(1)



감별 구역	구성 물질	감시 원소	존재 확률	분석 결정
케이블의 플라스틱 절연체	폴리머	Pb, Br, Sb ^a	High	Yes
플러그의 플라스틱 몸체	폴리머	Pb, Br, Sb ^a	High	Yes
Metal prongs	금속 합금	Cu, Zn, (Pb)	Moderate	Yes

^a 브로민(Br)과 안티몬(Sb)의 존재는 규제된 브로민화 난연재의 사용으로 표시될 수 있다.

6-2. XRF Screening Test(2)



➤ Image mapping 형 XRF

수십 마이크로미터 크기의 매우 작은 시료의 스크리닝 가능

작은 부피의 물질의 존재 여부 측정가능

➤ XRF 분석 결과

점	Si %	Cu %	Zn %	Sn %	Pb %	Ti %	Fe %
1	5.2	18.6	43	6.25	35.98	—	—
2	6.5	1.7	3.9	—	82.9	3.9	1.2

RoHS II 기술문서 작성 요약

1. 선정된 재질/부품은 XRF 및 정밀 분석 진행

- (1) 재질/부품에 대한 DoC
- (2) 재질/부품에 대한 분석 리포트
- (3) 재질/부품에 대한 물질 선언
- (4) 재질/부품의 위험성 평가
- (5) 협력사 평가
- (6) 하위 부품의 연관성 증명

기술문서
(Technical Document)

RoHS II 문서 검토(1)



December 2012

Environmental Certificate (TSM/TSP Tantalum MnO2 and Polymer Stacks)

KEMET Electronics Corporation ("KEMET") hereby certifies that the products listed below (the "Products") are compliant with the restricted substance requirements of the European Parliament and the Council of the European Union's Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment and Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (collectively referred to as "RoHS"). KEMET further certifies that the Products, except where specifically exempted by RoHS, do not contain lead in amounts in excess of the maximum concentration value of 1,000 ppm or cadmium in amounts in excess of the maximum concentration value of 100 ppm as defined by RoHS. This certificate is applicable only to the Products which have been manufactured on or after the dates listed below, ordered with the appropriate termination code in the KEMET part numbers noted in the table below and have been sold by KEMET by an authorized KEMET distributor to the Customer. For more information on KEMET's environmental compliance initiatives, refer to our Green Product Roadmap at www.kemet.com/page/greenproduct

RoHS 규제에 명시된 예외를 제외하고, RoHS 규제에 의해 정의된 카드뮴 100 ppm의 최대 농도 값과 그 외 물질 1,000 ppm 을 초과하지 않는 것을 증명한다.

Product(s): **Key for Determining Adherence to 2002/95/EC and as amended by 2011/65/EU Content Criteria¹**
☒ = Meets criteria at the homogeneous level ☐ = Does not meet criteria at the homogeneous level

6가지 RoHS 물질 제한 규제치

KEMET Product	Series	Material and MCV ¹	Restricted Material						Compliant Version
			Cd	Cr ⁶⁺	Pb	Hg	PBB	PBDE	
		Termination Code 2	< 0.01%	< 0.1%	< 0.1%	< 0.1%	< 0.1%	< 0.1%	
MnO2 Stacks	TSM	T or B	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Available Since Release
MnO2 Stacks	TSM	H or C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Polymer Stacks	TSP	T or B	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Available Since Release
Polymer Stacks	TSP	H or C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

공급자로부터 제공 받는 제품정보

¹ MCV = Maximum Concentration Values per 2011/65/EU amending RoHS Directive 2002/95/EC.

² Termination code is found in the 14th position of the KEMET part number.

Certified by:

Name: Conrado Hinojosa
Title: Senior Vice President, KEMET Tantalum Business Unit

사인 및 지장

KEMET Electronics
P.O. Box 5628, Greenville, South Carolina 29606 U.S.A.
Tel: 864.963.6300 Fax: 864.963.6521

공급업체 정보

Information subject to change without notice. Monitor website regularly for updates. KEMET is not liable for any damages, direct or indirect, consequential or otherwise, that the reader might incur as a result of ignoring this warning, or that any third party might suffer as a result of the reader's ignoring this warning.

기준 :

공급업체로부터 제공받은 제품
정보에 대한 일치 관계 확인

Global Business Partner

RoHS II 문서 검토(예시)

beyond Steppers

RoHS-II

Declaration of RoHS-Conformity

Wir, die Hersteller, erklären hiermit, dass die Bauart der nachfolgend bezeichneten Produkte in der von uns in Verkehr gebrachten Ausführung der Richtlinie 2011/65/EU des Europäischen Parlaments und des Rates zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten (RoHS) vom 08. Juni 2011 und der chinesischen RoHS-Richtlinie SJ/T 11363 - 2006 entspricht.

We, the manufacturer, declare hereby on our own responsibility, that the following product meets all the provisions of the EU Directive 2011/65/EC of the European Parliament and of the Council of 08. June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment and the Standard of the Electronics Industry of the People's Republic of China SJ/T 11363 - 2006

Artikelbezeichnung Part name	Artikelnummer ID-No.
ZSS 25.200.0,6-GPL 22.1/7	05001756 + 10010870

Die nachfolgende Tabelle zeigt, welche verbotenen Substanzen enthalten (X) bzw. nicht enthalten (O) sind.

The table below shows, which hazardous substances are included (X) respectively not included (O).

Pb	Hg	Cd	Cr6+	PBB	PBDE
max. 0,1 Gew.-% up to 0,1 % by weight*)	max. 0,1 Gew.-% up to 0,1 % by weight	max. 0,01 Gew.-% up to 0,01 % by weight	max. 0,1 Gew.-% up to 0,1 % by weight	max. 0,1 Gew.-% up to 0,1 % by weight	max. 0,1 Gew.-% up to 0,1 % by weight
O	O	O	O	O	O

*) Für Legierungen gelten folgende Regelungen:

Aluminium-Legierungen max. 0,4 Gew.-%

Stahl-Legierungen max. 0,35 Gew.-%

Kupfer-Legierungen max. 4 Gew.-%

Lead as an alloying element:

aluminium containing up to 0,4 % lead by weight

steel containing up to 0,35 % lead by weight

copper alloy containing up to 4 % lead by weight

Angewandete Ausnahmeregelung / Applied exemptions

Nicht zutreffend / Not applicable

Gröbenzell, den 15.07. 2013 / Gröbenzell, July 15th, 2013

ppa/j
Techni
chmid
r/ Technical Director

TECHNOLOGY

ROHS2 AND HALOGEN COMPLIANCE:

In addition, PLX's products with a part number ending with the suffix F, LF or G, meet the requirements of the current RoHS Recast Directive 2011/65/EU or RoHS2, with limits as specified below for RoHS 6/6 compliance:

Cadmium (Cd)	< 100 ppm
Lead (Pb)*	< 1000 ppm
Mercury (Hg)	< 1000 ppm
Hexavalent Chromium (Cr6)	< 1000 ppm
Polybrominated biphenyls (PBB)	< 1000 ppm
Polybrominated diphenyl ethers (PBDE)	< 1000 ppm


* Note 1: A PLX part number without the suffix F, LF or G is RoHS 5/6 with exemption 7b (Lead (Pb) included on the leads or within the solder balls)

* Note 2: Flip chip devices with internal eutectic bump meet RoHS 6/6 requirements with exemption 15 applied for the level 1 bump interconnect. Those applicable eutectic bump part numbers will include an 'F' or 'G' suffix for PEX8xxx products.

Note 3: A PLX part number with suffix 'G' is Halogen-Free per IEC 61249-2-21 definition.

Chlorine (Cl)	< 900 ppm
Bromine (Br)	< 900 ppm
Total Halogens (Chlorine + Bromine)	< 1500 ppm

PLX CONTACT INFORMATION:

Authorized Representative's Signature : 
 Authorized Representative's Name : Edwin Laoreno
 Authorized Representative's Title : Sr. Quality Assurance and Reliability Engineer
 Authorized Representative's Phone number : (408) 328-3587
 Authorized Representative's Email : elaoreno@plxtech.com
 Company website : www.plxtech.com

End of the CoC

AP-OS-08925

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Geschäftsführung Siegfried Hartmann
 Reg.-Gericht München - HRB 44 426
 USt-Ident.-Nr. DE 128 242 222
 Steuernummer 137-135-10072

Gewerbesteuerbescheinigung - Kto. 76410 - GLZ 70195466
 IBAN DE 4770 1894 4400 00944819 - BIC GENODEF33HAN
 SparkassenFörderungsbauk - Kto. 1800125 - GLZ 70053070
 Oberbank München - Kto. 1041021121 - BLZ 701 20700
 Volksbank Fürstentum - Kto. 712531 - BLZ 70163370
 Postbank München - Kto. 0266001800 - BLZ 70010089

Global Business Partner

 KOTITI 시험연구원

RoHS II 문서 검토(2)



TRS Ceramics, Inc.
2820 East College Avenue, State College, PA 16801
Phone: 814-238-7485, Fax: 814-238-7539

RoHS COMPLIANCE STATEMENT

Materials supplied by TRS Technologies are RoHS compliant due to one or both of the exemptions shown below.

RoHS Exemptions as defined in Annex III and Annex IV of the Directive.:

Annex III 7(c)-1

Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound

Annex IV exemption 14

Lead in single crystal piezoelectric materials for ultrasonic transducers

Signature: _____

A handwritten signature in black ink, appearing to read "William Farnan", written over a horizontal line.

Name (printed): _____

William Farnan

Title: _____

Quality Manager

REFERENCES

European Directive 2011/65/EU

판단 :

날짜 미 표기 - Reject

Global Business Partner



KOTITI 시험연구원

RoHS II 문서 검토(3)

KOTITI

Global Business Partner

www.kotiti.re.kr

138-7, Sangdaewon-dong, Jungwon-gu, Seongnam-si, Gyeonggi-do, 462-807, Korea TEL: (822)3451-7000 FAX: (822)3451-7171

분석 기관명

TEST REPORT

KOTITI NO. : 1111000551
APPLICANT : O., LTD.
DATE IN : April 07, 2014
DATE OUT : April 09, 2014

Report No 및
신청업체 정보,
분석 일

시료 설명

Sample Description	Slider
Sample Quantity	TWO (2) SAMPLES
Color(s) Submitted	Not Submitted
Buyer	Not Submitted
Item Number	EO-IG900B*****
Material	Zinc/Cr ³⁺ plating
Testing Period	April 07, 2014 ~ April 09, 2014
Test Result	For further details, please refer to the following page(s).

분석 기관표기

승인된 서명

PREPARED and CHECKED by :

Sang Rag Lee

Dr. SANG RAG LEE
VICE PRESIDENT - KOTITI

REMARK: SEE ENCLOSED WORKSHEET(S) RESULT

AUTHORIZED by :

Young R. Kim

Dr. YOUNG RYUL KIM
PRESIDENT - KOTITI

Global Business Partner

KOTITI 시험연구원

RoHS II 문서 검토(4)

1314000556-1 (PAGE 2 OF 4)

시료 설명

Tested Sample List:			
Sample No.	Sample Description	Color	Material
1	Backing Block	Not Submitted	Tungsten Oxide + Urethane

Report No 및
페이지 수

분석 항목

Restriction of Hazardous Substances (EU Directive 2011/65/EU) Unit: mg/kg			
Test Item(s)	LRL	Sample No.	
Lead (Pb)	5	1	ND
Mercury (Hg)	5		ND
Cadmium (Cd)	5		ND
Hexavalent Chromium (Cr ⁶⁺)	2		ND
*PBBs	10		ND
*PBDEs	10		ND

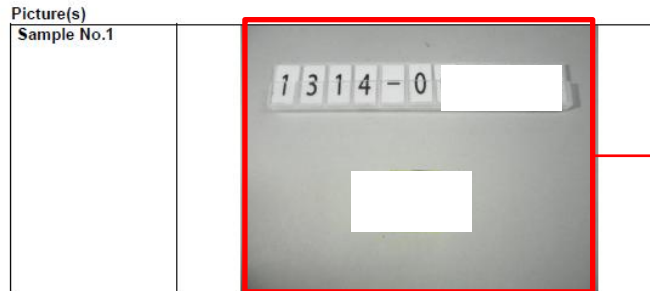
분석 결과

Report Limit

Remark 1) ND : Not Detected(< LRL(Laboratory Report Limit))
2) NA : Not Applicable
3) Requirement : Pb, Hg, Cr⁶⁺, PBBs, PBDEs <1000 mg/kg, Cd <100 mg/kg

Test 1) Reference to IEC 62321:2008 by acid digestion and determined by ICP-OES (Pb, Cd, Hg)
Method 2) Reference to IEC 62321:2008 (Annex C) by alkaline digestion and determined by UV-VIS (Cr⁶⁺)
3) Reference to IEC 62321:2008 (Annex A) by solvent extraction and determined by GC-MS (PBBs, PBDEs)

분석 방법 및
분석 장비



Report No 및
시료 사진

RoHS II 문서 검토(5)

Material declaration Data Sheet

Part	Model	Part/Number	Part Name	Material Name	Content (mg)	Substance Name	Content (wt%, mg)	CAS NO	Analysis Result (ppm/ppb)					
									RoHS					
CHIP RESISTOR	RC1006		① - Body	Al2O3	0.537	Alumina Substrate	96.05700	1344-28-1	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
			② - Resistive layer	R-14UM	0.023	R-14UM	3.69600	12036-10-1	N.D.	206.000	N.D.	N.D.	N.D.	N.D.
			③ - Top Conductor	Ag	0.025	Silver	4.00600	7440-22-4	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
			④ - Terminal Conductor(Ni & Cr)	Ni & Cr	0.003	Ni & Cr	0.48100	7440-02-0	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
			⑤ - Bottom Conductor	Ag	0.001		0.16000	7440-22-4	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
			⑥ - Insulation (1st Overcoat)	Glass	0.004		0.64100	65997-18-4	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
			⑦ - Insulation (2nd Overcoat)	Polymer	0.007		1.12200	Trade secret	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
			⑧ - Termination (1st Plating)	Ni	0.001		0.00000	7440-02-0	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
			⑨ - Termination (2nd Plating)	Sn	0.014		2.24400	7440-51-6	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

② - Resistive layer

BOM 의 Part name 과 분석
리포트의 Product 동일

TEST REPORT

Applicant : Samsung Electro-Mechanics Co., Ltd.
Address : 314, Maetan-3dong, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 443-743 Korea

Report No. RT12R-S0178-036-E1-R

Page: 1 of 5
Date: Jan. 25, 2012

Sample Description : The following submitted sample(s) said to be:

Name/Type of Product : Resistive layer
Name of Material : R-15UM
Sample ID No. : RT12R-S0178-036
Item No. : R-15UM
Manufacturer/Vender : Samsung Electro-Mechanics Co., Ltd.

Sample received : Jan 23, 2012
Testing Date : Jan 23, 2012
Testing Environment : 23 ± 2 °C, Humidity : (60 ± 5) % R.H.

Test Type : RoHS test chemical analysis

Name/Type of Product : Resistive layer

Name of Material : R-15UM

Approved by:

Jade Jang

Jade Jang / Lab. Technical Manager

Authorized by:

Bo Park

Bo Park / Lab. General Manager

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Intertek Testing Services Korea Ltd.

Seoul Office: Tel : 02-6090-9500 Fax : 02-3409-0026 Daegu Office: Tel : 053-600-8647 Fax : 053-600-8645 Web Site : www.intertek.co.kr
Seoul Lab. Address : 1/F, A-Ju Digital Tower, #204-56, Seongju 2-gu, Seongdong-Gu, Seoul, 133-833 Korea
Ulsan Lab. Address : #540-2, Yongam-Ri, Chongryong-Myun, Ulsan, Ulsan 689-855 Korea

Global Business Partner

KOTITI 시험연구원

RoHS II 문서 검토(6)

2013년 4월 5일 11:57AM ILSUX

No. 7223 P. 3/4

TEST REPORT (시험 성적서)

시험 성적서 번호 (Report No.): RT11R-S1631-K

발행 번호 (Page): 3 of 4

시험품 용번호 (Sample ID No.): RT11R-S1631

발행 일자 (Date): 2011. 04. 25.

시험품명 (Sample Description): Air Cap
(Air Cap)

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

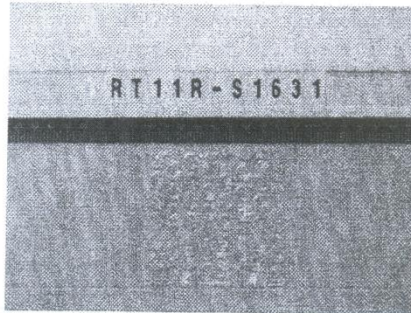


사진 판독 불가

Cherng-Weei Technology Corp.

Declaration of REACH (SVHC)

Cherng Weei (include subcontractor) guarantees that our item no :

F203-R1GP-D030-08-CF084

has qualified with REACH (SVHC) standard of prohibited material since 1st of August, 2009. The concentration of prohibited material in component or product that Cherng Weei and Cherng Weei's subcontractor supply to Dqline Co., Ltd

will not over than **REACH (SVHC)** standard.

物質名稱	CAS Number	中文名稱
Anthracene	120-12-7	蒽
4,4'- Diaminodiphenylmethane	101-77-9	4,4'-二胺基二苯甲烷
Dibutyl phthalate	84-74-2	鄰苯二甲酸二丁酯
Cyclododecane	294-62-2	環十二烷
Cobalt dichloride	7646-79-9	二氯化鈷
Diarsenic pentaoxide	1303-28-2	五氧化二砷
Diarsenic trioxide	1327-53-3	三氧化二砷
Sodium dichromate, dihydrate	7789-12-0	重鉻酸鈉
5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)	81-15-2	二甲苯麝香
Bis (2-ethyl(hexyl)phthalate) (DEHP)	117-81-7	鄰苯二甲酸二(2-乙基己基)酯
Hexabromocyclododecane (HBCDD)	25637-99-4	六溴環十二烷
Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)	85535-84-8	短鏈氯化石蠟
Bis(tributyltin)oxide	56-35-9	氧化三丁錫
Lead hydrogen arsenate	7784-40-9	砷酸氫鉛
Triethyl arsenate	15606-95-8	三乙基砷酸鹽
Benzyl butyl phthalate	85-68-7	鄰苯二甲酸丁苄酯

Authorized Signature/Chop : Jusara Lee

李素珍

Company Name : CHERNG WEEI TECHNOLOGY CORP.

Company Address : 6F, No.490, Bannan Rd., Zhonghe Dist., New Taipei City 235, Taiwan (R.O.C.)

永承技術股份有限公司

RoHS 대응 불가

Global Business Partner

KOTITI 시험연구원

RoHS II 문서 검토(7)

Test Report No. F896

Issued Date: January 30, 2008

Page 2 of 3

Sample Description: LUPOX GP2305F-NP

Item No./Part No.: N/A

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	US EPA 3052(1996), US EPA 8010B(1996), ICP	0.5	N.D.
Lead (Pb)	mg/kg	US EPA 3052(1996), US EPA 8010B(1996), ICP	5	N.D.
Mercury (Hg)	mg/kg	US EPA 3052(1996), US EPA 8010B(1996), ICP	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	US EPA 3060A(1996), US EPA 7196A(1992), UV	1	N.D.

Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Dibromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tribromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tetrabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Pentabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Hexabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Heptabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Octabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Nonabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Decabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Monobromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Dibromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.

RoHS II 문서 검토(8)

TEST REPORT

Applicant : HyunE
Address : 276-17 p,
Gimpo a

Page: 1 of 4

Report No. F

Date: Feb

Sample Description : The following submitted sample(s) said to be:-

Name/Type of Product : PVC-WH
Sample ID No. : RT12R
Manufacturer/Vender : HyunE

Sample received : Feb. 16, 2012
Testing Date : Feb. 16, 2012 ~ Feb. 21, 2012
Testing Environment : Temperature : (24 ± 2) °C, Humidity : (60 ± 5) % R.H.

Test Type : RoHS wet chemical analysis
Test Method(s) : Please see the following page(s).
Test Result(s) : Please see the following page(s).

* Note 1 : The test results presented in this report relate only to the object tested.

* Note 2 : This report shall not be reproduced except in full without the written approval of the testing laboratory.

Approved by,

Jade Jang / Lab. Technical Manager

Authorized by,

Bo Park / Lab. General Manager

TEST REPORT

Page: 3 of 6
Date: Jan. 11, 2013

Report No. R

Sample ID No.

Sample Description :

Test Item	Unit	Test Method	MDL	Result
Bromine (Br)	mg/kg	With reference to EN 14582, by oxygen combustion with bomb and determined by IC	30	N.D.
Chlorine (Cl)	mg/kg	With reference to EN 14582, by oxygen combustion with bomb and determined by IC	30	N.D.
Antimony (Sb)	mg/kg	With reference to US EPA 3052, by acid digestion and determined by ICP-OES	2	177

Tested by : Nikkie Lee

Notes : mg/kg = ppm = parts per million
< = Less than
N.D. = Not detected (<MDL)
MDL = Method detection limit

* View of sample as received:-



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Intertek Testing Services Korea Ltd.

Seoul Office: Tel : 02-6090-9500 Fax : 02-3409-0026 Daegu Office : Tel : 053-600-8647 Fax : 053-600-8645 Web Site : www.intertek.co.kr
Seoul Lab. Address : 1/F, A-ju Digital Tower, #284-56, Seongsu 2-ga, Seongdong-Gu, Seoul, 133-833 Korea
Ulsan Lab. Address : #340-2, Yongam-Ri, Chongryang-Myun, Ulsu-Gun, Ulsan 689-865 Korea

Global Business Partner

KOTITI 시험연구원

RoHS II 문서 검토(9)

Test Report No. F690101/LF-CTSAYAA13-21416

Issued Date: 2013. 05. 06 Page 1 of 5

To: TD.

The following merchandise was submitted and identified by the client as :

SGS File No. : AY/

Product Name : BAF

Item No./Part No. : N/A

Received Date : 201

Test Period : 201 .06

Test Results : For further details, please refer to following page(s)

Test Performed : SGS Korea tested the sample(s) selected by applicant with following results.

SGS Korea Co., Ltd.

Jeff Jang

Jeff Jang / Chemical Lab Mgr

Timothy Jeon
Jinhee Kim
Cindy Park
Jerry Jung/ Testing Person

Test Report No. F690101/LF-CTSAYAA13-21416

Issued Date: 2013. 05. 06 Page 3 of 5

Sample No. : A'

Sample Description : Bi

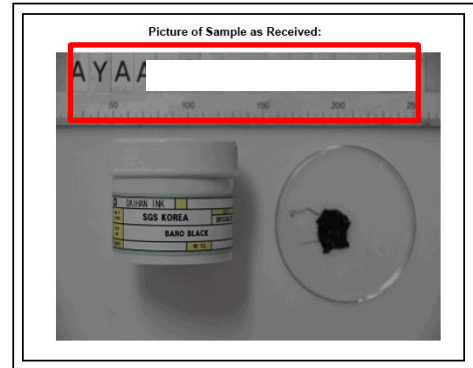
Item No./Part No. : N

Materials : Liqueu

Halogen Content

Test Items	Unit	Test Method	MDL	Results
Bromine(Br)	mg/kg	BS EN 14582:2007 , IC	30	N.D.
Chlorine(Cl)	mg/kg	BS EN 14582:2007 , IC	30	47

Picture of Sample as Received:



NOTE:

- (1) N.D. = Not detected (<MDL)
- (2) mg/kg = ppm
- (3) MDL = Method Detection Limit
- (4) - = No regulation
- (5) Negative = Undetectable / Positive = Detectable
- (6) ** = Qualitative analysis (No Unit)
- (7) * = Boiling-water-extraction:
Negative = Absence of CrVI coating
Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.

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SGS Korea Co., Ltd.

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FD05 Version5

SGS Korea Co., Ltd.

322, The O valley, 555-9, Hoggie-dong, Dongan-gu, Anyang-si, Gyeonggi-do, Korea 431-080
T +82 (0)31 4608 000 F +82 (0)31 4608 059 <http://www.sgs.com> www.kr.sgs.com

Member of the SGS Group (Société Générale de Surveillance)

RoHS II 문서 검토(10)

Test Report

No. F690701/LF-CTS075948

Date : November 22, 2007

Page 1 of 3

[REDACTED]
Incheon, Korea

The following merchandise was submitted and identified by the client as : -

Type of Product	:	PCB [REDACTED]
SGS File No.	:	G-49/2007-3656/4
Buyer	:	[REDACTED] CORP.
Materials	:	CEM-1
Sample Receiving Date	:	November, 22, 2007
Test Performed Date	:	November, 28, 2007
Remark	:	Please refer to a samples photo of the last page
Test Performed	:	SGS Testing Korea tested the sample which was selected by applicant with

Global Business Partner

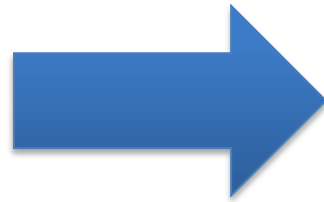
RoHS II 문서 검토(참고)

US EPA 3050B, 3052

BS EN 1122

US EPA 3060A

US EPA 3540C



IEC 62321

IEC 62321 제정 이유?

- 국제전기표준회의 (IEC : International Electrotechnical Commission) 는 환경규제 대응 혼란을 막기 위해 표준화 작업

KOTITI 시험연구원 기술문서(1)

LOGO

RoHS Technical Document

Date : ****, 2013 ~ ****, 2013	→ 분석 일정
Company Name : ***** Address : *****	
Product Name : ***** Model Name : *****	→ 업체 정보 및 제품/ 모델 명 표기
Contact Person : Assistant Manager ***** Telephone : *****	
	→ 업체 담당자 정보

Related Directive : EU Directive 2011/65/EU

Evaluation Result : In compliance with RoHS

Revision History

Date	Revision No.	Issue
2013. ****	Rev.0	Initial Issue

이력관리

Prepared by : _____

Approved by : _____

LOGO

Table of contents

1. Product description	3
2. Standards for Control of Substances concerning Product Environment ----	4
3. Part List.....	5
4. Risk assessment	6
5. Assessment of high risk	7
5-1 Critical Component List(CCL)	7
5-2 CCL sample pictures	9
6. Normative references	10

APPENDIX A. Material confidence assessment

APPENDIX B. Supplier confidence assessment

APPENDIX C. Analytical test report






1. 제품 정보
2. 제품 환경 물질 관리 기준
3. 제품 내 문서와 해당하는 재질, 부품, 모듈 사이의 관계를 보여주는 정보
4. 위험성 평가
5. 선정된 재질/부품 검증
6. 참조 규격

Global Business Partner

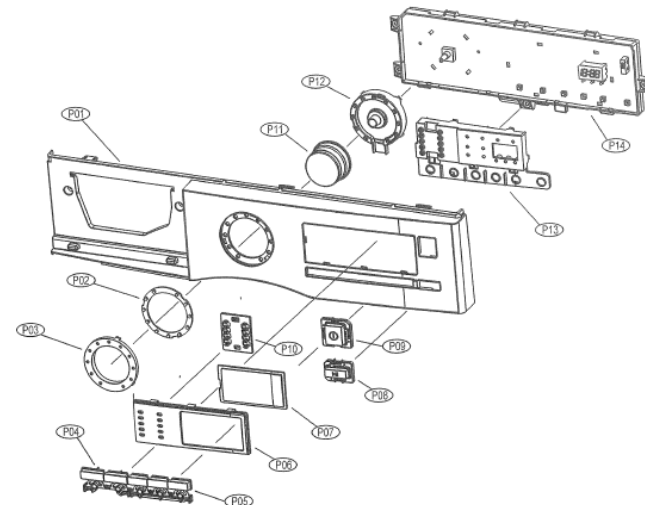
KOTITI 시험연구원 기술문서(3)

제품 내 문서와 해당하는 재질, 부품, 모듈 사이의 관계를 보여주는 정보

2. Part List

No.	Code	Part name	Supplier	Photograph
1	BEMCO-0033	PCB TXVM175-KB004	Hanjin	
2	BEMD0-0008	17INCH LCD TALLY	Hanjin	
3	BEMZ0-0042	PCB XVM175-EB001	Hanjin	
4	BEMA0-0122	canare DIP BCJ-FPC02(BCJ-FPC05) BNC	Canare Corporation of Korea	
5	BAE00-0108	TOOTH WASHER (IN TOOTH) $\phi 15 \times 1.1t^*$ ($\phi 11.3$)	Canare Corporation of Korea	

■ PANEL FRONT AS



No.	PART NAME	PART CODE	SPECIFICATION	Q'TY	REMARK
P01	PANEL F	36142T4D00	ABS, D-H'S 1ST	1	
P02	DECO WINDOW	36116DWM00	ABS, D-H'S 1ST	1	
P03	DECO COURSE	36116DWN00	ABS, D-H'S 1ST	1	
P04	BUTTON OPTION	3616650000	ABS, D-H'S 1ST	1	
P05	BUTTON FUNCTION	3616650100	ABS, D-H'S 1ST	1	
P06	WINDOW COURSE	3615512800	ABS, D-H'S 1ST	1	
P07	WINDOW DISPLAY	3615512700	ABS(TR558), D-H'S 1ST	1	
P08	WINDOW FUNCTION	3615512600	ABS(TR558), D-H'S 1ST	1	
P09	BUTTON START	3616650200	ABS, D-H'S 1ST	1	
P10	BUTTON POWER	3616650300	ABS, D-H'S 1ST	1	
P11	KNOB DIAL	3613409700	ABS, D-H'S 1ST	1	
	DECO KNOB DIAL	36116DWP00	ABS, D-H'S 1ST	1	
P12	HOLDER COURSE	3613065800	HIPS, D-H'S 1ST	1	
P13	HOLDER FUNCTION	3613065700	HIPS, D-H'S 1ST	1	
P14	PCB AS	PRPSSWM010	D-HT1011 / HD1411	1	

KOTITI 시험연구원 기술문서(3-1)

제품 내 문서와 해당하는 재질, 부품, 모듈 사이의 관계를 보여주는 정보



KOTITI 미래환경사업본부
KOTITI Future Environment Business Division

1314000773-3 (PAGE 3 OF 4)



518-6, Yoksam 1-Dong, Gangnam-Gu, Seoul, 155-862, Korea
Tel : (822) 6461 7000, 6461-7116 Fax : (822) 6461 7188
Website : www.kotitire.kr

SCREENING (ED-XRF, Spot Test)

Restriction of Hazardous Substances Directive (RoHS / 2011/65/EU), mg/kg

Test Item	# 1	# 2	# 3	# 4	# 5	MDL	
						Polymer	Metal
Lead	217	1 388	N.D.	66	-	50	100
Cadmium	N.D.	N.D.	N.D.	N.D.	-	20	50
Mercury	N.D.	N.D.	N.D.	N.D.	-	50	100
Total Cr	126	68 322	N.D.	N.D.	-	30	50
Spot Test (Cr VI)	N.A.	Negative	N.A.	N.A.	-	-	-
Total Br	1 035	N.A.	87	121	-	50	-

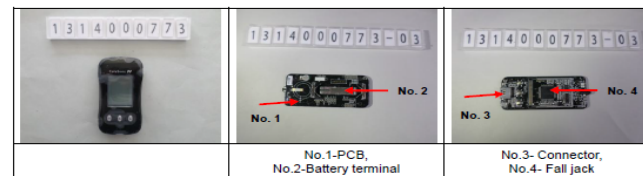
PRECISION ANALYSIS

Restriction of Hazardous Substances Directive (RoHS / 2011/65/EU), mg/kg

Test Item	# 1	# 2	# 3	# 4	# 5	MDL	REQUIREMENTS
Lead	3 579	859	N.D.	N.D.	-	< 5	1 000
Mercury	N.D.	N.D.	N.D.	N.D.	-	< 5	1 000
Cadmium	N.D.	N.D.	N.D.	N.D.	-	< 5	100
Chromium VI	N.D.	N.D.	N.D.	N.D.	-	< 2	1 000
PBBs	N.D.	N.A.	N.D.	N.D.	-	< 5	1 000
PBDEs	N.D.	N.A.	N.D.	N.D.	-	< 5	1 000

1314000773-3 (PAGE 4 OF 4)

SAMPLE PICTURE



KOTITI 시험연구원 기술문서(4)

LOGO

4. Risk Assessment

No.	Part name	Part Code	Supplier
1	HANDEL Case	3611149500	AI
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			

No.	Part name	Part Code	Supplier	Risk Assessment				CCL ⁽⁵⁾ Yes / No
				Probability Material ⁽¹⁾	Parts for evaluation of	Supplier ⁽³⁾	Document ⁽⁴⁾	
1	PCB MAIN MANUAL AS(P320FMM00 2)	P320FMM102	I	H	H	H	L	Y
2	PCB CONTROL AS(P220GMC00 1)	P220GMC101	I	H	H	H	L	Y
3	PCB CONTROL AS(P220GMC00 2)	P220GMC102	I	H	H	H	L	Y
4	IC LCD CONTROLLER PCB DAC	1MST67889W		H	L	H	L	N
5	AS(PSDAT0001-)	PSDA0001--	I	H	L	H	L	N

평가

Note:

1) Probability material: Risk assessment for materials

- The item shall be classified into 'H' in case that more than one restricted substance is indicated with 'H' according to standard of IEC/PAS 62596 (Refer to appendix A).
- For Polymer material is classified into 'H' since the different addition agents are used.
- For Coating material is classified into 'H' since it may contain the restricted substances.

* L: Low, M: Medium, H: High

2) Parts of a product selected by OOOO to evaluate for quality assurance

3) Trustworthiness of the supplier: Risk assessment for Supplier

- Classification according to assessment criteria for corporate (Refer to appendix B)

* L: Low, M: Medium, H: High

4) Non-conformity probability of document from a supplier

* L: Low, M: Medium, H: High

5) CCL : Sample is included into 'Critical Component List (CCL)' if there is at least two H value expressed among the three items - Material, Supplier and Analytical Results(ED-XRF) in our report or, equal to Parts of a product selected by Company to evaluate for quality assurance

2. 기업의 제한물질 위해성 평가

3. 공급 업체의 신뢰성 평가 (위험성 평가)

4. 공급 업체 문서 평가

5. CCL : 두개 이상의 High risk 재질 평가 시 XRF 및 정밀분석

추가 검증

- CCL : Critical Component List

Global Business Partner

KOTITI 시험연구원 기술문서(5)

LOGO

5. Assessment of high risk

5-1 CCL¹⁾, Critical Component List(CCL¹⁾)

No.	Screening Test(XRF) (Unit : mg/kg)					Precision Analysis (Unit : mg/kg)					Attachment (Evidence attached, Institute, report no., date)	Exemption No. ²⁾	Verdict
	Pb	Cd	Hg	Cr	Br	Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs		
1	-	-	-	-	-	N.D.	N.D.	N.D.	N.D.	N.D.	Tested by KOTITI, Report No. 1311004312. Issued date : 2013-03-18	6(a)	Pass ³⁾
2													
3													
4	1												
	2												
5	1												
	2												
6													
7	1												
	2												

Note:

1) CCL : Sample is included into 'Critical Component List (CCL)' if there is at least two H value expressed among the three items - Material, Supplier and Analytical Results(ED-XRF) in our report or, equal to Parts of a product selected by Company to evaluate for quality assurance

2) Exemption No.: EU RoHS exemption No.

N/A: Not Applicable

3) PASS : The test report which the client has submitted has been verdicted.

● Test Equipment



XRF
(X-ray Fluorescence Spectrometer)



ICP-OES
(Inductively Coupled Plasma - Optical Emission Spectrometer)



UV-VIS
(UV-Vis-Spectrophotometer)



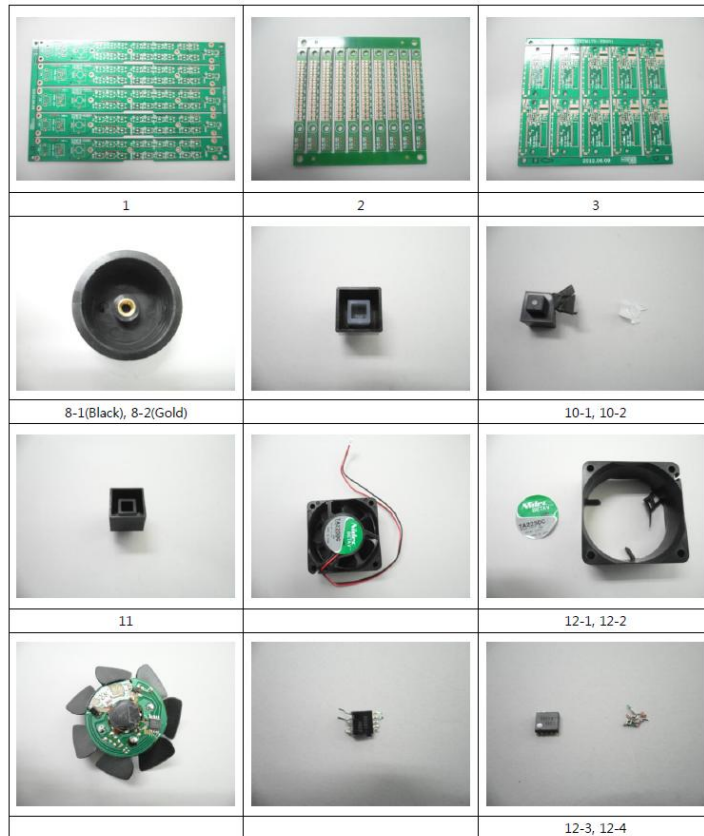
GC-MS
(Gas Chromatography-Mass Spectrometer)

1. XRF 는 IEC 62321-3-1 에 의거 각 재료의 기준에 맞는 규제치를 적용함
2. 정밀분석은 XRF Screening 후 기준치를 초과한 물질만 분석함

KOTITI 시험연구원 기술문서(6)

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5-2 CCL sample pictures



6. Normative References

- 1) IEC 62321 series, Determination of certain substances in electrotechnical products
- 2) IEC 62321-2 , Disassembly, disjointment and mechanical sample preparation
- 3) EN 50581, Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
- 4) IEC/TR 62476, Guidance for evaluation of products with respect to substance-use restrictions in electrical and electronic products

1. IEC 62321 유해물질 분석방법
2. IEC 62321-2 샘플 분해 방법
3. EN 50581 전기전자 제품 내 유해물질 제한을 평가하는 것을 기술 문서화하는 표준
4. IEC/TR 62476 제품 내 제한물질을 평가하는 가이드
5. IEC/PAS 62596 제한물질 측정을 위한 샘플링 절차 가이드

KOTITI 시험연구원 기술문서

LOGO

RoHS Technical Document

Date : 2013.10.10 ~ 2013.10.10

Company Name

Address

Product Name

Model Name

Contact Person

Telephone

Related

Directive

Evaluation Result

Revision History

Rev. No.

Rev. Date

Rev. Description

Rev. Content

Rev. Date

Rev. Description

Rev. Content

Rev. Date

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1. Product description
2. Standards for Con
3. Part List
4. Risk assessment
5. Assessment of h
5-1 Critical Case
5-2 CCL sample
6. Normative refer

LOGO

1. Product Description

Product picture

APPENDIX A. Mate
APPENDIX B. Sup
APPENDIX C. Anal

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2. Standards for Control of Substances concerning Product Environment

In order to sell our products to the world marketplace, OOOO must guarantee and verify environmental compliance for all parts and components of finished products to prevent adverse effects on the environment and the health. The following list of substances with environmental impacts was developed based on global regulatory and requirements of customers.

OOOO는 국제 환경규제 및 고객 요구사항

이제부터 전 세계 환경규제 및 고객 요구사항

이제부터 전 세계 환경규제 및 고객 요구사항

이제부터 전 세계 환경규제 및 고객 요구사항

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이제부터 전 세계 환경규제 및 고객 요구사항

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3. Part List

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4. Risk Assessment

No.	Part Name	Part Code	Supplier	Restricted Substances	RoHS	REACH	RoHS	REACH
1	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
2	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
3	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
4	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
5	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
6	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
7	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
8	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
9	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
10	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
11	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
12	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
13	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
14	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
15	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
16	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
17	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
18	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
19	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
20	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y

Note:
1) Probability material. Risk assessment for materials.
- The item shall be classified into 'Y' if it is not more than one restricted substance is indicated with 'Y' according to standard of (EC) No 609/2002 (Refer to appendix A).
- For Polymer material is classified into 'Y' since the different addition agents are used.
- For Coating material is classified into 'Y' since it may contain the restricted substances.
- 'L' Low, 'M' Medium, 'H' High.
2) Parts of a product selected by OOOO to evaluate for quality assurance.
3) Traceability of the supplier. Risk assessment for supplier.
- Classification according to assessment criteria for corporate (Refer to appendix B).
- 'L' Low, 'M' Medium, 'H' High.
4) Non-conformity probability of document from a supplier.
- 'L' Low, 'M' Medium, 'H' High.
5) OOOO Sample is included into Critical Component List (CCL) if there is at least two 'H' value expressed among the three items: Material, Supplier and Analytical Results (D-APP) in our report or, equal to Parts of a product selected by Company to evaluate for quality assurance.

LOGO

5. Assessment of high risk

5-1. CCL, Critical Component List (CCL)

No.	Part Name	Part Code	Supplier	Restricted Substances	RoHS	REACH	RoHS	REACH
1	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
2	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
3	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
4	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
5	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
6	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
7	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
8	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
9	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
10	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
11	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
12	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
13	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
14	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
15	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
16	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
17	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
18	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
19	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y
20	RESISTOR	000000	ABC Co.	None	Y	Y	Y	Y

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Note:
1) OOOO Sample is included into Critical Component List (CCL) if there is at least two 'H' value expressed among the three items: Material, Supplier and Analytical Results (D-APP) in our report or, equal to Parts of a product selected by Company to evaluate for quality assurance.
2) OOOO Sample is included into Critical Component List (CCL) if there is at least two 'H' value expressed among the three items: Material, Supplier and Analytical Results (D-APP) in our report or, equal to Parts of a product selected by Company to evaluate for quality assurance.
3) (ROHS) - The test report within the test lot.

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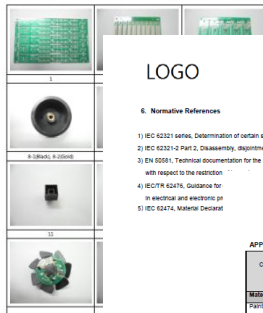
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5-2. CCL sample pictures



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6. Normative References

- 1) IEC 62321 series, Determination of certain substances in electrochemical products
- 2) IEC 62321-2 Part 2,

Declaration of Conformity

회사 로고

KOTITI Testing & Research Institute
(Sangdaewon-dong)111, Sagimakdol-ro, Jungwon-gu
Seongnam-si, Gyeonggi-do, Korea

DECLARE UNDER OUR SOLE RESPONSIBILITY THAT THE PRODUCT:

PRODUCT : Sample
Model Name : Sample - 1

TO WHICH THIS DECLARATION RELATES IS IN CONFORMITY WITH THE
FOLLOWING STANDARD(S) OR OTHER NORMATIVE DOCUMENT(S)

RoHS: IEC 62321:2009
EN 50581:2012

FOLLOWING THE PROVISIONS OF THE

RoHS DIRECTIVE 2011/65/EU

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

Aug 29, 2013

(Date of issue)

(Name and signature of authorized person)

정보

IS 및
규격

명

RoHS 규제에 명시된 예외를 제외하고, RoHS 규제에 의해 정해진 카드뮴 0.01% 의 최대 농도 값과 그 외 물질 0.1% 를 초과하지 않는 것을 증명한다.

<http://www.kotiti.re.kr>

KOTITI 시험연구원

신성장사업본부 환경규제대응팀

김민성 02-3451-7374, 010-8797-1183

Kim_ms@kotiti.re.kr