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Test Report

No.: EGZ2209050063C00314R

Date: Oct. 26, 2022

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Applicant : SHENZHEN TUOZHU TECHNOLOGY CO., LTD.
委托单位 : 深圳拓竹科技有限公司
Address : ROOM 201, BUILDING A, No. 1 FIRST QIANWAN ROAD, QIANHAI SHENGANG COOPERATION ZONE, SHENZHEN
地 址 : 深圳市前海深港合作区前湾一路1号A栋201室

Sample Name : Bambu PLA-CF(with Bambu Reusable Spool)
样品名称 : 3D 打印线材
Model/型号 : A50-K0-1.75-1000-spl

Received Date : Oct. 18, 2022
接收日期 : 2022年10月18日
Test Period : Oct. 18, 2022~ Oct. 26, 2022
检测日期 : 2022年10月18日~2022年10月26日

Test Requested : As requested by client, to evaluate the compliance of the submitted sample with EU RoHS Directive 2011/65/EU Annex II and its amendment (EU) 2015/863 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
检测要求 : 根据客户要求, 对送测样品进行欧洲议会及理事会于2011年6月8日决定的关于在电子电器产品中限制使用某些有害物质的指令2011/65/EU中附件II的修订指令(EU) 2015/863要求的符合性评估。

Test Method :
检测方法 :
1. Review was performed for the sample and the related Bill of Materials submitted by the Applicant.
对客户所提交的样品及其相关材料清单进行检查、评估。
2. a) To refer to the standard IEC 62321-2:2013, review was performed for the samples disjointed from the submitted articles.
参照标准 IEC 62321-2:2013, 对客户所提交的样品进行拆分。
b) To refer to the standard IEC 62321-1:2013, tests were performed for the samples indicated by the photos in this report.
参照标准 IEC 62321-1:2013, 对客户所提交的指定图片样品进行测试。
c) To refer to the standard IEC 62321-3-1:2013: Screening by XRF Spectroscopy.
参照标准 IEC 62321-3-1:2013: X射线荧光扫描筛选测试。
d) Wet chemical test
湿化学测试

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- 1) to refer to IEC 62321-5:2013, determine the Cadmium, Lead content by ICP-OES.
参照 IEC 62321-5:2013, 用 ICP-OES 测定铅(Pb)、镉(Cd)的含量。
- 2) to refer to IEC 62321-4:2013+A1:2017, determine the Mercury content by ICP-OES.
参照 IEC 62321-4:2013+AMD1:2017, 用 ICP-OES 测定汞(Hg)的含量。
- 3) to refer to IEC 62321-7-1:2015 & IEC 62321-7-2:2017, determine the Hexavalent Chromium(Cr(VI)) content by UV-Vis.
参照 IEC 62321-7-1:2015 & IEC 62321-7-2:2017, 用 UV-Vis 测定六价铬(Cr(VI))的含量。
- 4) to refer to IEC 62321-6:2015, determine the Polybrominated Biphenyls(PBBs) and Polybrominated Diphenyl Ethers(PBDEs) by GC-MS.
参照 IEC 62321-6:2015, 用 GC-MS 测定多溴联苯(PBBs)和多溴二苯醚(PBDEs)的含量。
- 5) to refer to IEC 62321-8:2017, determine the Bis(2-ethylhexyl) phthalate(DEHP), Dibutyl phthalate(DBP), Benzylbutyl phthalate(BBP) and Diisobutyl phthalate (DIBP) by GC-MS.
参照 IEC 62321-8:2017, 用 GC-MS 测定邻苯二甲酸二(2-乙基己)酯(DEHP)、邻苯二甲酸二丁酯(DBP)、邻苯二甲酸丁苄酯(BBP)和邻苯二甲酸二异丁酯(DIBP)含量。

Test Results : Please refer to next page (s).
测试结果 : 请参见下一页



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Conclusion:

执行测试总结:

Basing on the test results obtained from the homogeneous materials, the submitted sample **COMPLIES** with EU RoHS Directive 2011/65/EU Annex II and its amendment (EU) 2015/863.

所提交样品中均质材料的测试结果符合 RoHS 指令 2011/65/EU 中附件 II 的修订指令(EU) 2015/863 的要求。



Signed for and on behalf of
EMTEK(Guangzhou) Co., Ltd.

Prepared by:

Lainey

Tang Lidong, Lainey
Assistant engineer

Reviewed by:

Ethan

Sun Wei, Ethan
Technical supervisor

Approved by:



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1. Test Sample List/检测样品清单

Sample No. 样品序号	Sample Description 样品描述
1	Wire reel-grey hard plastic 线材卷筒-灰色硬塑料
2	Tape-silvery fiber 胶布-银色纤维
3	3D Printing filament-black solid 3D打印线材-黑色固体

2. Pb,Cd,Hg,Cr(VI),PBBs,PBDEs Test Results/测试结果

No. 序号	Restricted substances 受限物质	Results of EDXRF ⁽¹⁾ EDXRF 结果 ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg) 湿化学测试结果 ⁽²⁾ (毫克/千克)	Remark ⁽²⁾ 备注 ⁽²⁾
1	Cd	BL	---	No comment 无
	Pb	BL		
	Hg	BL		
	Cr	BL		
	Br	BL		
2	Cd	BL	---	No comment 无
	Pb	BL		
	Hg	BL		
	Cr	BL		
	Br	BL		
3	Cd	BL	---	No comment 无
	Pb	BL		
	Hg	BL		
	Cr	BL		
	Br	BL		

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3. Phthalates (DBP, BBP, DEHP, DIBP) Test Results/邻苯二甲酸酯(DBP, BBP, DEHP, DIBP)测试结果

No. 序号	Restricted substances 受限物质	CAS No. CAS 号	Results of Wet chem. Test (%) 湿化学测试结果 (%)	MDL 方法检测限 (%)	Limit 限值 (%)
1	DBP	84-74-2	ND	0.003	0.1
	BBP	85-68-7	ND	0.003	0.1
	DEHP	117-81-7	ND	0.003	0.1
	DIBP	84-69-5	ND	0.003	0.1
2	DBP	84-74-2	ND	0.003	0.1
	BBP	85-68-7	ND	0.003	0.1
	DEHP	117-81-7	ND	0.003	0.1
	DIBP	84-69-5	ND	0.003	0.1
3	DBP	84-74-2	ND	0.003	0.1
	BBP	85-68-7	ND	0.003	0.1
	DEHP	117-81-7	ND	0.003	0.1
	DIBP	84-69-5	ND	0.003	0.1

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Note 备注:

- (1) ① Results are obtained by XRF for primary screening, and further wet chemical testing by ICP-OES / AAS (for Cd, Pb, Hg), UV-Vis (for Cr(VI)) and GC/MS (for PBBs, PBDEs) is recommended to be performed, if an inconclusive result was found (as "X" in below table)(unit: mg/kg).
XRF 结果是初步筛选,如果有不确定结果(如下表中"X")需要进一步通过 ICP-OES/AAS(针对镉,铅,汞), UV-Vis (针对六价铬)以及 GC/MS(针对多溴联苯,多溴二苯醚)做湿化学分析(单位:毫克/千克)。
- ② OL = Over Limit, BL = Below Limit, X = Inconclusive, NA= Not Applicable.
OL = 超出限值, BL = 低于限值, X = 不确定, NA= 不适用。
- ③ The XRF screening test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.
针对元素的扫描结果-不均一材料的测试值与真实值可能存在差异。

Element 分析元素	Polymer 聚合物材料	Metal 金属材料	Composite Materials 电子元件
镉 Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$LOD < X < (150+3\sigma) \leq OL$
铅 Pb	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
汞 Hg	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
溴 Br	$BL \leq (300-3\sigma) < X$	NA	$BL \leq (250-3\sigma) < X$
铬 Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$

- (2) ① mg/kg = ppm = 0.0001%, ND = Not Detected (Less than method detection limit.).
毫克/千克 = 0.0001%, ND = 未检测到 (小于方法检测限)。
- ② Unit and Method Detection Limit (MDL) in wet chemical test.
湿化学测试中的单位和方法检测限。

Test items 测试项目	铅 Pb	镉 Cd	汞 Hg	Cr(VI)(Non-metal) Cr(VI)(非金属)	PBBs(single) 多溴联苯 (单个)	PBDEs(single) 多溴二苯醚 (单个)
Unit 单位	mg/kg 毫克/千克	mg/kg 毫克/千克	mg/kg 毫克/千克	mg/kg 毫克/千克	mg/kg 毫克/千克	mg/kg 毫克/千克
MDL 方法检测限	2	2	2	8	5	5

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- ③ According to IEC 62321-7-1:2015, result on Cr(VI) for metal sample is shown as Positive/Negative.

依据 IEC 62321-7-1:2015, 金属样品中 Cr(VI)的结果用阳性/阴性来表示。

- a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than $0.13\mu\text{g}/\text{cm}^2$.
The sample plating is considered to contain Cr(VI).
a. 当六价铬(Cr(VI))结果为阳性(浓度大于 $0.13\mu\text{g}/\text{cm}^2$), 表示样品镀层含有六价铬(Cr(VI))。
- b. The sample is negative for Cr(VI) if the Cr(VI) concentration is less than $0.10\mu\text{g}/\text{cm}^2$.
The sample is considered a non-Cr(VI) based plating.
b. 当六价铬(Cr(VI))结果为阴性(浓度小于 $0.10\mu\text{g}/\text{cm}^2$), 表示样品镀层不含有六价铬(Cr(VI))。
- c. The result between $0.10\mu\text{g}/\text{cm}^2$ and $0.13\mu\text{g}/\text{cm}^2$ is considered to be inconclusive-
unavoidable plating variations may influence the determination.
c. 当六价铬(Cr(VI))结果介于 0.10 及 $0.13\mu\text{g}/\text{cm}^2$ 时, 无法确定镀层是否含有六价铬(Cr(VI))。

Storage condition and production date of the tested sample are unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.

由于未知测试样品的储存条件及生产日期, 测试结果仅代替样品在测试期间的状态。

- ④ According to IEC 62321-3-1:2013, this column represents the results of wet chemical test. And "---" means no need to perform wet chemical test, when the XRF screening results are qualified.
根据 IEC 62321-3-1:2013 的标准要求, 这列内容代表化学测试结果, 而 "---" 代表前面 XRF 扫描测试合格后不需要再做化学测试。

- (3) This column represents the exempted decoration of material or other related testing sample's information. And "No comment" means no note.

这列内容代表有关材料的豁免声明或者其它必要的批注, 而 "无" 代表没有批注。



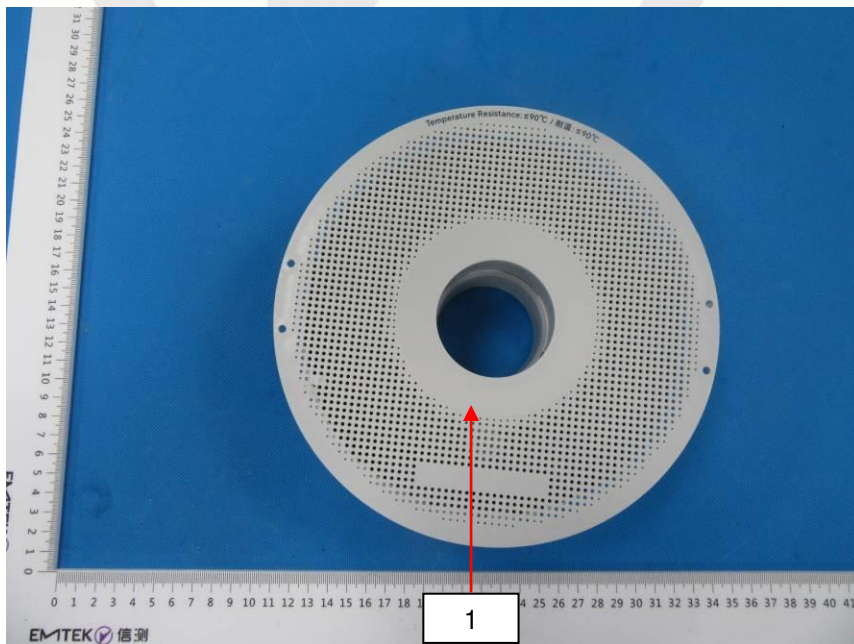
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4. Sample Photos 样品照片



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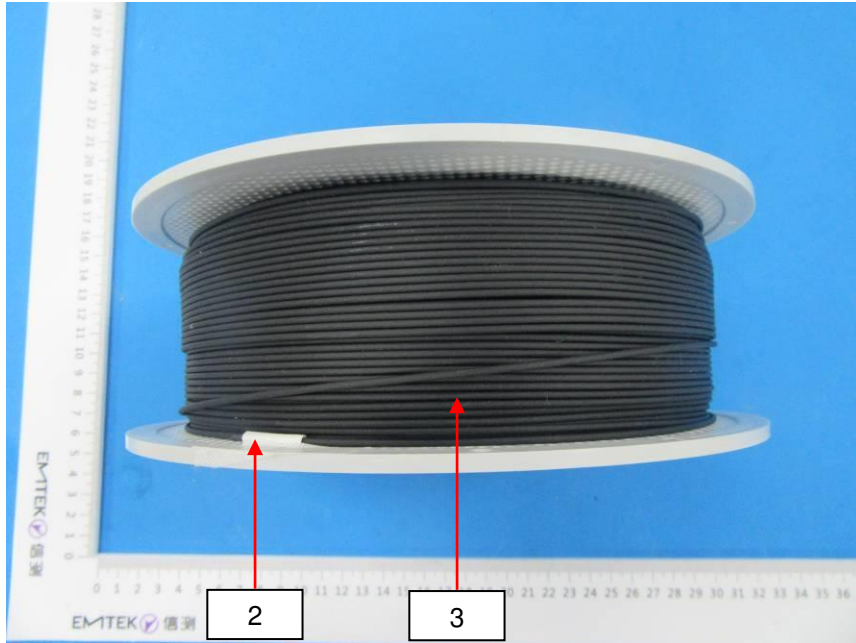


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*** End of Report ***
报告结束

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ANNEX

RESTRICTED SUBSTANCES LIST

Restricted substances 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%)
Bis(2-ethylhexyl) phthalate (DEHP) (0.1%)	Butyl benzyl phthalate (BBP) (0.1%)
Dibutyl phthalate (DBP) (0.1%)	Diisobutyl phthalate (DIBP) (0.1%)

EXEMPTION LIST

- 1 Mercury in single capped (compact) fluorescent lamps not exceeding (per burner):
 - 1(a) For general lighting purposes < 30W: 5mg (expires on 31 December 2011; 3.5mg may be used per burner after 31 December 2011 until 31 December 2012; 2.5mg shall be used per burner after 31 December 2012)
 - 1(b) For general lighting purposes \geq 30W and <50W: 5mg (expires on 31 December 2011; 3.5mg may be used per burner after 31 December 2011)
 - 1(c) For general lighting purposes \geq 50W and <150W: 5mg
 - 1(d) For general lighting purposes \geq 150W: 15mg
 - 1(e) For general lighting purposes with circular or square structural shape and tube diameter \leq 17mm (no limitation of use until 31 December 2011; 7mg may be used per burner after 31 December 2011)
 - 1(f) For special purposes: 5mg
 - 1(g) For general lighting purposes < 30 W with a lifetime equal or above 20 000 h: 3,5 mg (Expires on 31 December 2017)
- 2(a) Mercury in double-capped linear fluorescent lamps for general lighting purposes not exceeding (per lamp):
 - 2(a)(1) Tri-band phosphor with normal lifetime and a tube diameter < 9mm (e.g. T2): 5mg (expires on 31 December 2011; 4mg may be used per lamp after 31 December 2011)
 - 2(a)(2) Tri-band phosphor with normal lifetime and a tube diameter \geq 9mm and \leq 17mm (e.g. T5): 5mg (expires on 31 December 2011; 3mg may be used per lamp after 31 December 2011)
 - 2(a)(3) Tri-band phosphor with normal lifetime and a tube diameter > 17mm and \leq 28mm (e.g. T8): 5mg (expires on 31 December 2011; 3.5mg may be used per lamp after 31 December 2011)
 - 2(a)(4) Tri-band phosphor with normal lifetime and a tube diameter > 28mm (e.g. T12): 5mg (expires on 31 December 2012; 3.5mg may be used per lamp after 31 December 2012)
 - 2(a)(5) Tri-band phosphor with long lifetime (\geq 25000h): 8mg (expires on 31 December 2011; 5mg may be used per lamp after 31 December 2011)
- 2(b) Mercury in other fluorescent lamps not exceeding (per lamp):
 - 2(b)(2) Non-linear halophosphate lamps (all diameters): 15mg (expires on 13 April 2016)
 - 2(b)(3) Non-linear tri-band phosphor lamps with tube diameter > 17mm (e.g. T9) (no limitation of use until 31 December 2011; 15mg may be used per lamp after 31 December 2011)
 - 2(b)(4) Lamps for other general lighting and special purposes (e.g. induction lamps) (no limitation of use until 31 December 2011; 15mg may be used per lamp after 31 December 2011)
- 3 Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes not exceeding (per lamp):
 - 3(a) Short length (\leq 500mm) (No limitation of use until 31 December 2011; 3.5mg may be used per lamp after 31 December 2011)
 - 3(b) Medium length (> 500mm and \leq 1500mm) (No limitation of use until 31 December 2011; 5mg may be used per lamp after 31 December 2011)
 - 3(c) Long length (> 1500mm) (No limitation of use until 31 December 2011; 13mg may be used per lamp after 31 December 2011)
- 4(a) Mercury in other low pressure discharge lamps (per lamp) (no limitation of use until 31 December 2011; 15mg may be used per lamp after 31 December 2011)
- 4(b) Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index $R_a > 60$:
 - 4(b)-I $P \leq 155W$ (no limitation of use until 31 December 2011; 40mg may be used per burner after 31 December 2011)
 - 4(b)-II $155W < P \leq 405W$ (no limitation of use until 31 December 2011; 40mg may be used per burner after 31 December 2011)
 - 4(b)-III $P > 405W$ (no limitation of use until 31 December 2011; 40mg may be used per burner after 31 December 2011)
- 4(c) Mercury in other High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner):
 - 4(c)-I $P \leq 155W$ (no limitation of use until 31 December 2011; 25mg may be used per burner after 31 December 2011)
 - 4(c)-II $155W < P \leq 405W$ (no limitation of use until 31 December 2011; 30mg may be used per burner after 31 December 2011)
 - 4(c)-III $P > 405W$ (no limitation of use until 31 December 2011; 40mg may be used per burner after 31 December 2011)

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ANNEX

EXEMPTION LIST

Continued

- 4(d) Mercury in High Pressure Mercury (vapour) lamps (HPMV) (expires on 13 April 2015)
- 4(e) Mercury in metal halide lamps (MH)
- 4(f) Mercury in other discharge lamps for special purposes not specifically mentioned in this Annex
- 4(g) Mercury in hand crafted luminous discharge tubes used for signs, decorative or architectural and specialist lighting and lightartwork, where the mercury content shall be limited as follows: (Expires on 31 December 2018)
- (a) 20 mg per electrode pair + 0,3 mg per tube length in cm, but not more than 80 mg, for outdoor applications and indoor applications exposed to temperatures below 20 °C;
- (b) 15 mg per electrode pair + 0,24 mg per tube length in cm, but not more than 80 mg, for all other indoor applications.
- 5(a) Lead in glass of cathode ray tubes
- 5(b) Lead in glass of fluorescent tubes not exceeding 0.2% by weight
- 6(a) Lead as an alloying element in steel for machining purposes and in galvanized 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. piezoelectric devices, or in a glass or ceramic matrix compound
- 7(c)-II Lead in dielectric ceramic in capacitors for a rated voltage of 125V AC or 250V DC or higher
- 7(c)-III Lead in dielectric ceramic in capacitors for a rated voltage of less than 125V AC or 250V DC (expires on 1 January 2013 and after that date may be used in spare parts for EEE placed on the market before 1 January 2013).
- 7(c)-IV Lead in PZT based dielectric ceramic materials for capacitors being part of integrated circuits or discrete semiconductors
- 8(a) Cadmium and its compounds in one shot pellet type thermal cut-offs (expires on 1 January 2012 and after that date may be used in spare parts for EEE placed on the market before 1 January 2012)
- 8(b) Cadmium and its compounds in electrical contacts
- 9 Hexavalent chromium as an anti-corrosion agent of the carbon steel cooling system in absorption refrigerators up to 0.75% by weight in the cooling solution
- 9(b) Lead in bearing shells and bushes for refrigerant-containing compressors for heating, ventilation, air conditioning and refrigeration (HVACR) applications
- 11(b) Lead used in other than C-press compliant pin connector systems (expires on 1 January 2013 and after that date may be used in spare parts for EEE placed on the market before 1 January 2013)
- 13(a) Lead in white glasses used for optical applications
- 13(b) Cadmium and lead in filter glasses and glasses used for reflectance standards
- 14 Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80% and less than 85% by weight (expires on 1 January 2011 and after that date may be used in spare parts for EEE placed on the market before 1 January 2011)
- 15 Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages
- 17 Lead halide as radiant agent in High Intensity Discharge (HID) lamps used for professional reprography applications
- 18(b) Lead as activator in the fluorescent powder (1% lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP (BaSi2O5:Pb)
- 21 Lead and cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glass
- 24 Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors
- 25 Lead oxide in surface conduction electron emitter displays (SED) used in structural elements, notably in the seal frit and frit ring
- 29 Lead bound in crystal glass as defined in Annex 1 (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC
- 30 Cadmium alloys as electrical/mechanical solder joints to electrical conductors located directly on the voice coil in transducers used in high-powered loudspeakers with sound pressure levels of 100 dB (A) and more
- 31 Lead in soldering materials in mercury free flat fluorescent lamps (which e.g. are used for liquid crystal displays, design or industrial lighting)
- 32 Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes
- 33 Lead in solders for the soldering of thin copper wires of 100 µm diameter and less in power transformers
- 34 Lead in cermet-based trimmer potentiometer elements
- 37 Lead in the plating layer of high voltage diodes on the basis of a zinc borate glass body

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Test Report

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