

TEST REPORT

Reference No. : TRHZ1404505

Date : Apr. 03, 2014

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Client : JIAXING HONGYUE ELECTRON CO., LTD.
Address : XINGZHUANG VILLAGE, XINCHENG TOWN, JIAXING CITY, ZHEJIANG PROVINCE, CHINA.

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

Name of Product : SOLAR LIGHT
Tested Main Model : HY-S511(B)
Tested Other Model : /
May Cover Model : Please refer to next page(s).
Sample Received : Mar. 17, 2014
Mar. 25, 2014
Test Period : Mar. 17, 2014- Mar. 27, 2014
Test Request : According to customer's requirements, Split the sample and determine the Pb, Cd, Hg, Cr(VI), PBBs & PBDEs content of the parts.
Test Method :
1. Sample prepared with reference to IEC 62321-2:2013 Determination of certain substances in electrotechnical products - Part 2: Disassembly, disjunction and mechanical sample preparation
2. Sample Screening testing with reference to IEC 62321-3-1:2013 Determination of certain substances in electrotechnical products - Part 3-1: Screening - Lead, mercury, cadmium, total chromium and total bromine using X-ray fluorescence spectrometry.
3. Wet Chemical Test Method
a. Determination of Lead ,Cadmium by ICP-OES with reference to IEC 62321-5:2013
b. Determination of Mercury by ICP-OES with reference to IEC 62321-4:2013
c. Determination of Hexavalent Chromium by Spot test or UV-Vis Method with reference to IEC 62321:2008
d. Determination of PBBs and PBDEs by GC-MS with reference to IEC 62321:2008
Test Result : Please refer to next page(s).
Conclusion : Based on the analysis on the submitted samples, the test results **comply with** the RoHS Directive 2011/65/EU (RoHS 2.0) and its subsequent amendments.

Issued by:



TÜV NORD Green Product Service Centre
Technical Manager

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May Cover Model :

HY-A001/HY-A002/HY-A003/HY-A004/HY-A005/HY-A006/HY-A007/HY-A008/
HY-A009/HY-A010/HY-A011/HY-A012/HY-A013/HY-A014/HY-A015/HY-A016/HY-S10
5/HY-S105(B)/HY-S106/HY-S107/HY-S107(B)/HY-S315/HY-S316/HY-S317/HY-S318/
HY-S401/HY-S402/HY-S403/HY-S404/HY-S404(B)/HY-S405/HY-S406/HY-S407/HY-S
408/HY-S409/HY-S410/HY-S411/HY-S412/HY-S413/HY-S501/HY-S502/HY-S503/HY-
S504/HY-S505/HY-S505(B)/HY-S506/HY-S506(B)/HY-S507/HY-S507(B)/HY-S509/HY-
-S510/HY-S511/HY-S511(B)/HY-S512/HY-S513/HY-S514/HY-S515/HY-S516/HY-S51
7/HY-S518/HY-S519/HY-205/HY-206/HY-206(B)/HY-207/HY-208/HY-209/HY-210/HY-
209/HY-P503/HY-P405/HY-P406/HY-P407/HY-P408/HY-P409/HY-P410/HY-P411/HY-
P412/HY-P413/HY-P414/HY-P415/HY-P416/HY-P417/HY-501/HY-502/HY-503/HY-50
4/HY-505/HY-505(B)/HY-506/HY-P001/HY-P001(B)/HY-P002/HY-P003/HY-P004/HY-
P005/HY-P006/HY-P007/HY-P008/HY-P009/HY-P011-1/HY-P011-2/HY-P011-3/HY-P0
12/HY-P401/HY-P402/HY-P403/HY-P404/HY-P404(B)/HY-601/HY-602/HY-603/HY-F0
02/HY-F002(B)/HY-F003/HY-F004/HY-F004(B)/HY-SS001/HY-SS002/HY-SS003/HY-S
S004/HY-SS005/HY-SS005(B)/HY-SS006/HY-SS007/HY-SS008/HY-SS009/HY-SS01
0/HY-SS011/HY-SS012/HY-SS013/HY-SS013(B)/HY-SS014/HY-SS015/HY-SS016/H
Y-SS017/HY-SS018/HY-SS019/HY-SZ001/HY-SZ002/HY-SZ003/HY-SZ004/HY-SZ00
4(B)/HY-SZ005/HY-SZ005(B)/HY-SZ006/HY-SZ007/HY-SZ008/HY-SZ009/HY-SZ010/
HY-SZ011/HY-SZ012/HY-SZ012(B)/HY-SZ013/HY-SZ014/HY-SZ015/HY-SZ016/HY-S
Z017/HY-SZ017(B)/HY-SZ017(C)/HY-SZ018/HY-SZ019/HY-SZ020/HY-SZ021/HY-SZ
022/HY-SZ023/HY-SZ024/HY-SZ025/HY-SZ026/HY-SZ027/HY-SZ028/HY-SZ029/HY-
SZ030/HY-SZ031/HY-SZ032/HY-SZ033/HY-SZ034/HY-SZ035/HY-SZ036/HY-SZ037/
HY-SZ038/HY-SZ039/HY-SZ040

***** To be continued *****

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TEST RESULTS:

Part No.	Part Description	Restricted Substances	Result of EDXRF (1)	Result of Chemical Testing (2) (mg/kg)	Conclusion on RoHS	Data Submitted / Resubmitted Date
1#	Silvery metal shell (shell)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL IN --- ---	--- --- --- Negative --- ---	Comply Comply Comply Comply NA NA	Mar. 19, 2014/ Mar. 21, 2014
2#	White plastic tube (shell)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL BL BL BL	--- --- --- --- --- ---	Comply Comply Comply Comply Comply Comply	Mar. 19, 2014
3#	Black plastic shell (shell)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL BL IN IN	--- --- --- --- N.D. N.D.	Comply Comply Comply Comply Comply Comply	Mar. 19, 2014/ Mar. 21, 2014
4#	Silvery metal solder strip (solar plate)	Pb Cd Hg Cr(VI) PBBs PBDEs	IN BL BL BL --- ---	60 ^R --- --- --- --- ---	Comply Comply Comply Comply NA NA	Mar. 19, 2014/ Mar. 27, 2014
5#	Silicon layer (solar plate)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL BL BL BL	--- --- --- --- --- ---	Comply Comply Comply Comply Comply Comply	Mar. 19, 2014

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Part No.	Part Description	Restricted Substances	Result of EDXRF (1)	Result of Chemical Testing (2) (mg/kg)	Conclusion on RoHS	Data Submitted / Resubmitted Date
6#	Transparent plastic sheet (solar plate)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL BL BL BL	--- --- --- --- --- ---	Comply Comply Comply Comply Comply Comply	Mar. 19, 2014
7#	Silvery solder tin (solar plate)	Pb Cd Hg Cr(VI) PBBs PBDEs	IN IN BL BL --- ---	60 ^R N.D. --- --- --- ---	Comply Comply Comply Comply NA NA	Mar. 19, 2014/ Mar. 27, 2014
8#	White rubber (solar plate)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL BL BL BL	--- --- --- --- --- ---	Comply Comply Comply Comply Comply Comply	Mar. 19, 2014
9#	Silvery metal screw (shell)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL IN --- ---	--- --- --- Negative --- ---	Comply Comply Comply Comply NA NA	Mar. 19, 2014/ Mar. 21, 2014
10#	Green PCB (lamp holder)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL BL IN IN	--- --- --- --- N.D. N.D.	Comply Comply Comply Comply Comply Comply	Mar. 19, 2014/ Mar. 21, 2014

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Part No.	Part Description	Restricted Substances	Result of EDXRF (1)	Result of Chemical Testing (2) (mg/kg)	Conclusion on RoHS	Data Submitted / Resubmitted Date
11#	Silvery solder tin (lamp holder)	Pb Cd Hg Cr(VI) PBBs PBDEs	IN IN BL BL --- ---	60 ^R N.D. --- --- --- ---	Comply Comply Comply Comply NA NA	Mar. 19, 2014/ Mar. 27, 2014
12#	Silvery metal pin (lamp holder)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL BL --- ---	--- --- --- --- --- ---	Comply Comply Comply Comply NA NA	Mar. 19, 2014
13#	Transparent LED (lamp holder)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL BL IN IN	--- --- --- --- N.D. N.D.	Comply Comply Comply Comply Comply Comply	Mar. 19, 2014/ Mar. 21, 2014
14#	White/Green rubber sheath (lamp holder)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL BL BL BL	--- --- --- --- --- ---	Comply Comply Comply Comply Comply Comply	Mar. 19, 2014
15#	Green ring resistor (PCB)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL BL BL BL	--- --- --- --- --- ---	Comply Comply Comply Comply Comply Comply	Mar. 19, 2014

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Part No.	Part Description	Restricted Substances	Result of EDXRF (1)	Result of Chemical Testing (2) (mg/kg)	Conclusion on RoHS	Data Submitted / Resubmitted Date
16#	Black electronic component (PCB)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL BL IN IN	--- --- --- --- N.D. N.D.	Comply Comply Comply Comply Comply Comply	Mar. 19, 2014/ Mar. 21, 2014
17#	Blue wire jacket (cable)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL BL BL BL	--- --- --- --- --- ---	Comply Comply Comply Comply Comply Comply	Mar. 19, 2014
18#	Coppery metal wire (cable)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL BL --- ---	--- --- --- --- --- ---	Comply Comply Comply Comply NA NA	Mar. 19, 2014
19#	Red wire jacket (cable)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL BL BL BL	--- --- --- --- --- ---	Comply Comply Comply Comply Comply Comply	Mar. 19, 2014
20#	Silvery metal spring (lamp holder)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL BL --- ---	--- --- --- --- --- ---	Comply Comply Comply Comply NA NA	Mar. 19, 2014

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Part No.	Part Description	Restricted Substances	Result of EDXRF (1)	Result of Chemical Testing (2) (mg/kg)	Conclusion on RoHS	Data Submitted / Resubmitted Date
21#	Silvery metal contact sheet (lamp holder)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL IN --- ---	--- --- --- Negative --- ---	Comply Comply Comply Comply NA NA	Mar. 19, 2014/ Mar. 21, 2014
22#	Silvery solder tin (lamp holder)	Pb Cd Hg Cr(VI) PBBs PBDEs	IN IN BL BL --- ---	60 ^R N.D. --- --- --- ---	Comply Comply Comply Comply NA NA	Mar. 19, 2014/ Mar. 22, 2014
23#	Black metal holder (PCB)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL IN --- ---	--- --- --- Negative --- ---	Comply Comply Comply Comply NA NA	Mar. 19, 2014/ Mar. 21, 2014
24#	Black plastic button (PCB)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL BL BL BL	--- --- --- --- --- ---	Comply Comply Comply Comply Comply Comply	Mar. 19, 2014
25#	Orange plastic sheet (PCB)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL BL BL BL	--- --- --- --- --- ---	Comply Comply Comply Comply Comply Comply	Mar. 19, 2014

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Part No.	Part Description	Restricted Substances	Result of EDXRF (1)	Result of Chemical Testing (2) (mg/kg)	Conclusion on RoHS	Data Submitted / Resubmitted Date
26#	Silvery metal contact sheet (PCB)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL BL --- ---	--- --- --- --- --- ---	Comply Comply Comply Comply NA NA	Mar. 19, 2014
27#	Silvery metal contact sheet (PCB)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL BL --- ---	--- --- --- --- --- ---	Comply Comply Comply Comply NA NA	Mar. 19, 2014
28#	Silvery metal spring (PCB)	Pb Cd Hg Cr(VI) PBBs PBDEs	BL BL BL BL --- ---	--- --- --- --- --- ---	Comply Comply Comply Comply NA NA	Mar. 19, 2014

***** To be continued *****

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Remark:

- (1) (a) It is the result on total Br while test item on restricted substances is PBBs/PBDEs. It is the result on total Cr while test item on restricted substances is Cr⁶⁺.
 (b) Results are obtained by EDXRF for primary screening, and further chemical testing by ICP-OES (for Cd, Pb, Hg), UV-Vis (for Cr⁶⁺) and GC/MS (for PBBs, PBDEs) is recommended to be performed, if the concentration exceeds the below warning value according to IEC62321-3-1:2013 (unit: mg/kg)

Element	Polymer	Metal	Composite Materials
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	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Hg	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Br	$BL \leq (300-3\sigma) < X$	--	$BL \leq (250-3\sigma) < X$
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$

- (c) BL = Below Limit, OL = Over Limit, IN = Inconclusive, LOD = Limit of Detection,
 -- = Not Regulated, NA = Not Applicable.

- (d) The XRF screening test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.

- (2) (a) mg/kg = ppm = 0.0001%, N.D.= Not Detected (<MDL), --- = Not Conducted.

- (b) Unit and Method Detection Limit (MDL) in wet chemical test

Test Items	Pb	Cd	Hg
Units	mg/kg	mg/kg	mg/kg
MDL	2	2	2

The MDL for single compound of PBBs & PBDEs is 5 mg/kg and MDL of Cr⁶⁺ for polymer & composite sample is 2 mg/kg.

- (c) According to IEC 62321:2008, result on Cr⁶⁺ for metal sample is shown as Positive/Negative.
 Positive = Presence of Cr⁶⁺ coating, Negative = Absence of Cr⁶⁺ coating.
 (d) (R)=Re-submitted sample.

***** To be continued *****

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(3) RoHS Exemptions

Exemptions	
RoHS Directive 2011/65/EU ANNEX III	
Exemption Items	Expires Date
1, Mercury in single capped (compact) fluorescent lamps not exceeding (per burner):	
1(a), For general lighting purposes < 30 W:2.5 mg	
1(b), For general lighting purposes ≥ 30 W and < 50W:3.5mg	
1l, For general lighting purposes ≥ 50 W and < 150 W: 5 mg	
1(d), For general lighting purposes ≥ 150 W: 15 mg	
1(e), For general lighting purposes with circular or square structural shape and tube diameter ≤ 17 mm: 7 mg	
1(f), For special purposes: 5 mg	
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 < 9 mm (e.g. T2): 4 mg	
2(a)(2), Tri-band phosphor with normal lifetime and a tube diameter ≥ 9 mm and ≤ 17 mm (e.g. T5): 3 mg	
2(a)(3), Tri-band phosphor with normal lifetime and a tube diameter > 17 mm and ≤ 28 mm (e.g. T8):3.5mg	
2(a)(4), Tri-band phosphor with normal lifetime and a tube diameter > 28 mm (e.g. T12): 3.5 mg	
2(a)(5), Tri-band phosphor with long lifetime (≥ 25 000 h): 5 mg	
2(b), Mercury in other fluorescent lamps not exceeding (per lamp):	
2(b)(2), Non-linear halophosphate lamps (all diameters): 15 mg	Expires on 13 April 2016
2(b)(3), Non-linear tri-band phosphor lamps with tube diameter > 17 mm (e.g. T9):15mg	
2(b)(4), Lamps for other general lighting and special purposes (e.g. induction lamps):15mg	
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 (≤500 mm):3.5mg	
3(b), Medium length (> 500 mm and ≤ 1 500 mm):5mg	
3l, Long length (> 1 500 mm):13mg	
4(a), Mercury in other low pressure discharge lamps (per lamp):15mg	
4(b), Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index Ra > 60:	
4(b) -I, P ≤155 W:30mg	
4(b) -II, 155 W < P ≤ 405 W:40mg	
4(b) -III, P > 405 W:40mg	
4l, Mercury in other High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner):	
4l-I, P ≤ 155 W:25mg	

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Exemptions	
RoHS Directive 2011/65/EU ANNEX III	
Exemption Items	Expires Date
4I-II, 155 W < P ≤ 405 W:30mg	
4I-III, P > 405 W:40mg	
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	
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	
6I, 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, onizing, transmission, and network management for telecommunications	
7I-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 compound	
7I-II, Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher	
7I-III, Lead in dielectric ceramic in capacitors for a rated voltage of less than 125 V AC or 250 V 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
7I-IV, Lead in PZT based dielectric ceramic materials for capacitors being part of integrated circuits or discrete semiconductors	Expires on 21 July 2016
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 anticorrosion 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(a), Lead used in C-press compliant pin connector systems	May be used in spare parts for EEE placed on the market before 24 September 2010
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

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RoHS Directive 2011/65/EU ANNEX III	
Exemption Items	Expires Date
12, Lead as a coating material for the thermal conduction module C-ring	May be used in spare parts for EEE placed on the market before 24 September 2010
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 (BaSi_2O_5 :Pb)	
21, Lead and cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses	
23, Lead in finishes of fine pitch components other than connectors with a pitch of 0,65 mm and less	May be used in spare parts for EEE placed on the market before 24 September 2010
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 I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC ⁽¹⁾	
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	
38, Cadmium and cadmium oxide in thick film pastes used on aluminium bonded beryllium oxide	
39, Cadmium in colour converting II-VI LEDs ($< 10 \mu\text{g Cd per mm}^2$ of light-emitting area) for use in solid state illumination or display systems	Expires on 1 July 2014

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Exemptions	
RoHS Directive 2011/65/EU ANNEX III	
Exemption Items	Expires Date
<p>Note: 1. ⁽¹⁾ OJ L 326, 29.12.1969, p.36.</p> <p>2. For the purposes of Directive 2011/65/EU, a maximum concentration value of 0,1 % by weight in homogeneous materials for lead, mercury, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) and of 0,01 % by weight in homogeneous materials for cadmium shall be tolerated.</p>	

Exemptions	
RoHS Directive 2011/65/EU ANNEX IV	
Equipment ionizing or detecting ionizing radiation	
Exemption Items	Expires Date
1. Lead, cadmium and mercury in detectors for ionizing 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 ionizing 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.	
Sensors, detectors and electrodes	
8.1a. Lead and cadmium in ion selective electrodes including glass of Pb electrodes.	
8.1b. Lead anodes in electrochemical oxygen sensors.	
8.1c. Lead, cadmium and mercury in infra-red light detectors.	
8.1d. Mercury in reference electrodes: low chloride mercury chloride, mercury sulphate and mercury oxide.	
9. Cadmium in helium-cadmium lasers.	
10. Lead and cadmium in atomic absorption spectroscopy lamps.	
11. Lead in alloys as a superconductor and thermal conductor in MRI.	
12. Lead and cadmium in metallic bonds creating superconducting magnetic circuits in MRI, SQUID, NMR (Nuclear Magnetic Resonance) or FTMS (Fourier Transform Mass Spectrometer) detectors.	Expires on 30 June 2021
13. Lead in counterweights.	
14. Lead in single crystal piezoelectric materials for ultrasonic transducers.	
15. Lead in solders for bonding to ultrasonic transducers.	
16. Mercury in very high accuracy capacitance and loss measurement bridges and in high frequency RF switches and relays in monitoring and control instruments not exceeding 20 mg of mercury per switch or relay.	
17. Lead in solders in portable emergency defibrillators.	
18. Lead in solders of high performance infrared imaging modules to detect in the range 8-14 µm.	

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Exemptions	
RoHS Directive 2011/65/EU ANNEX IV Equipment ionizing or detecting ionizing radiation	
Exemption Items	Expires Date
19. Lead in Liquid crystal on silicon (LcoS) displays.	
20. Cadmium in X-ray measurement filters.	
21. Cadmium in phosphor coatings in image intensifiers for X-ray images until 31 December 2019 and in spare parts for X-ray systems placed on the EU market before 1 January 2020.	
22. Lead acetate marker for use in stereotactic head frames for use with CT and MRI and in positioning systems for gamma beam and particle therapy equipment.	Expires on 30 June 2021.
23. Lead as an alloying element for bearings and wear surfaces in medical equipment exposed to ionizing radiation.	Expires on 30 June 2021
24. Lead enabling vacuum tight connections between aluminium and steel in X-ray image intensifiers.	Expires on 31 December 2019
25. Lead in the surface coatings of pin connector systems requiring nonmagnetic connectors which are used durably at a temperature below – 20 °C under normal operating and storage conditions.	Expires on 30 June 2021
26. Lead in — solders on printed circuit boards, — termination coatings of electrical and electronic components and coatings of printed circuit boards, — solders for connecting wires and cables, — solders connecting transducers and sensors, that are used durably at a temperature below – 20 °C under normal operating and storage conditions.	Expires on 30 June 2021
27. Lead in — solders, — termination coatings of electrical and electronic components and printed circuit boards, — connections of electrical wires, shields and enclosed connectors, which are used in magnetic fields within the sphere of 1 m radius around the isocentre of the magnet in medical magnetic resonance imaging equipment, including patient monitors designed to be used within this sphere, or magnetic fields within 1 m distance from the external surfaces of cyclotron magnets, magnets for beam transport and beam direction control applied for particle therapy.	Expires on 30 June 2020
28. Lead in solders for mounting cadmium telluride and cadmium zinc telluride digital array detectors to printed circuit boards.	Expires on 31 December 2017
29. Lead in alloys, as a superconductor or thermal conductor, used in cryo-cooler cold heads and/or in cryo-cooled cold probes and/or in cryo-cooled equipotential bonding systems, in medical devices (category 8) and/or in industrial monitoring and control instruments.	Expires on 30 June 2021
30. Hexavalent chromium in alkali dispensers used to create photocathodes in X-ray image intensifiers until 31 December 2019 and in spare parts for X-ray systems placed on the EU market before 1 January 2020.	

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Exemptions	
RoHS Directive 2011/65/EU ANNEX IV Equipment ionizing or detecting ionizing radiation	
Exemption Items	Expires Date
31. Lead, cadmium and hexavalent chromium in reused spare parts, recovered from medical devices placed on the market before 22 July 2014 and used in category 8 equipment placed on the market before 22 July 2021, provided that reuse takes place in auditable closed-loop business-to-business return systems, and that the reuse of parts is notified to the consumer.	Expires on 21 July 2021
32. Lead in solders on printed circuit boards of detectors and data acquisition units for Positron Emission Tomographs which are integrated into Magnetic Resonance Imaging equipment.	Expires on 31 December 2019
33. Lead in solders on populated printed circuit boards used in Directive 93/42/EEC class IIA and IIB mobile medical devices other than portable emergency defibrillators.	Expires on 30 June 2016 for class IIA and on 31 December 2020 for class IIB.
34. Lead as an activator in the fluorescent powder of discharge lamps when used for extracorporeal photopheresis lamps containing BSP (BaSi2O5:Pb) phosphors.	Expires on 22 July 2021

***** To be continued *****

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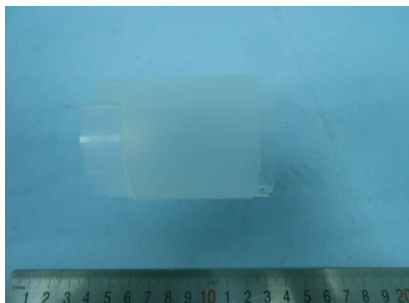
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SAMPLE PHOTOS



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***** To be continued *****

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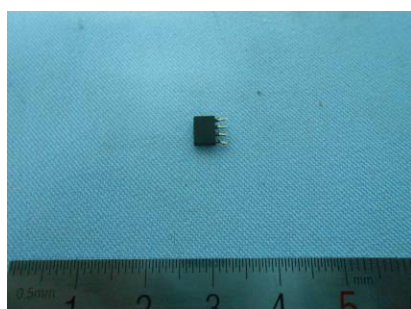
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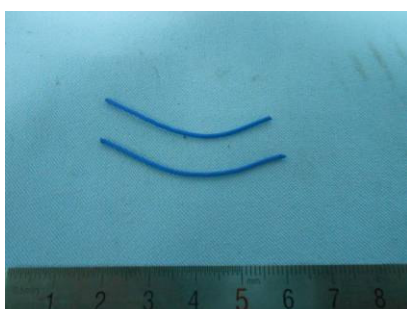
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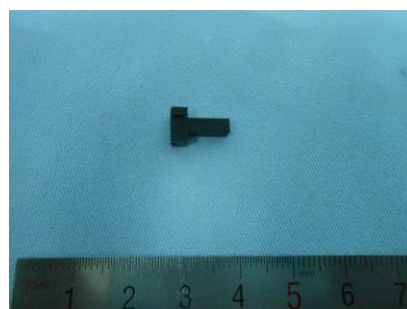
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***** To be continued *****

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26#



27#



28#



4#-(R)



7#-(R)



11#-(R)



22#-(R)

***** To be continued *****

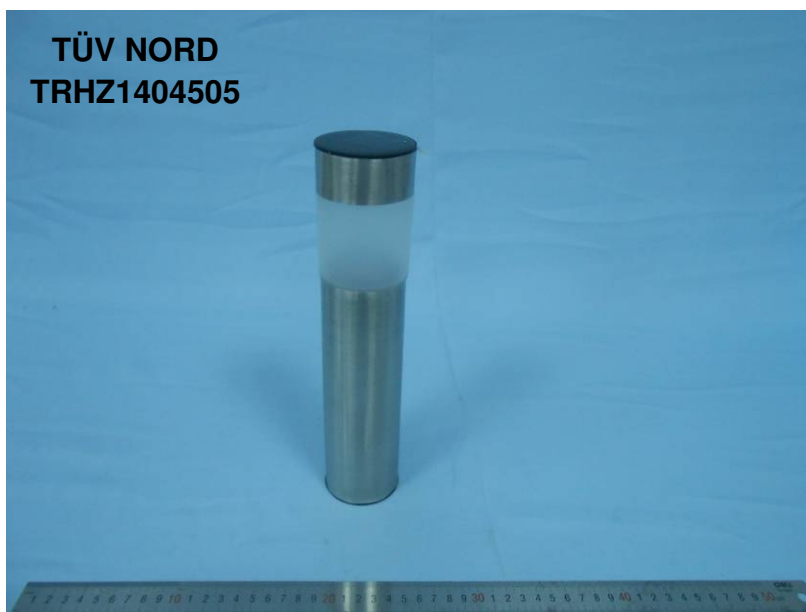
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MAIN MODEL'S PRODUCT PHOTO



MAY COVER MODEL'S PRODUCT PHOTOS

The following photo(s) was/were submitted and identified by the client, only for reference:



HY-S511



HY-SS018



HY-P003

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HY-602



HY-S515



HY-505



HY-SZ013



HY-A002



HY-SS016

***** END OF REPORT *****