

Survey Report

Report No.:NBR09091140162001

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Client :HYUNDAI Wacortec. co., LTD
Address :684-49, Gongreung-Dong, Nowon-Ku, Seoul, Korea

Sample Name :RO 泵
Test Model :DP125
Sample Received Date :Jun. 11, 2009
Testing Period :Jun. 21, 2009
Specification :According to EU RoHS Directive (2002/95/EC) and the request of client, this report is to survey the contents of Hazardous Substances in Electrical and Electronic Equipment.

Conclusion :Pass
The submitted complete machine is tested with reference to IEC 62321:2008 Ed.1 by "homogeneous material" principle. The test result stated as the following pages is compliant with the requirement of the RoHS Directive of European Commission.



Tested by Wengling

Inspected by Chen Dian

Approved by Chen Dian
Technical Manager

Date Sep.21,2009

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Test Method:

1. As specified by client, to analyze the contents of Lead, Cadmium, Mercury, Chromium, Bromine in the submitted sample by XRF. Screening limits in mg/kg for regulated elements in various matrices according to IEC 62321:2008 Ed.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	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
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	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$

Note: BL=Below limit;

X = The region where further investigation is necessary;

OL = Over limit;

3σ = The repeatability of the analyzer at the action level;

LOD= Limit of detection

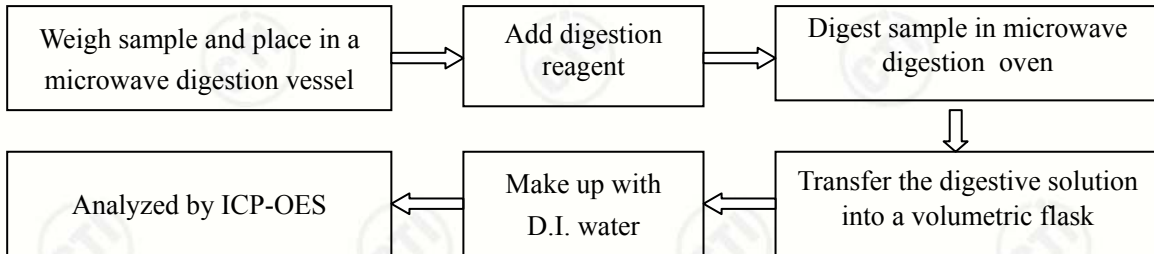
XRF testing results are only used for reference.

2. If XRF testing result is in the region of X, use chemical test to determine the hazardous substances

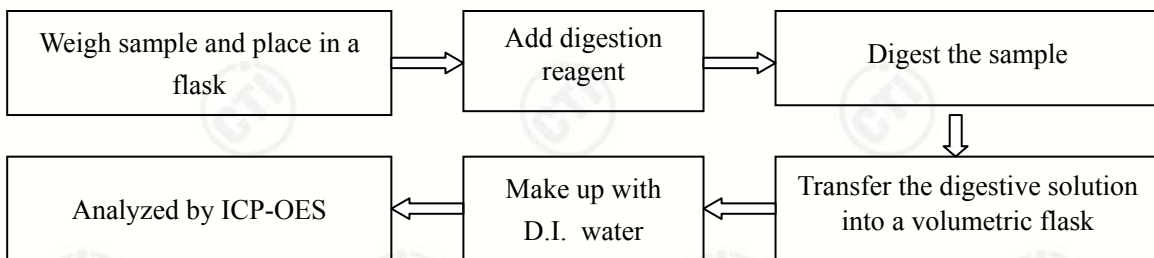
Tested Item	Pretreatment Method	Measured Equipment	Report Limit
Lead (Pb) /Cadmium (Cd)	Refer to IEC 62321:2008 Ed.1 Sec.8	ICP-OES	2 mg/kg
	Refer to IEC 62321:2008 Ed.1 Sec.9		
	Refer to IEC 62321:2008 Ed.1 Sec.10		
Mercury (Hg)	Refer to IEC 62321:2008 Ed.1 Sec.7	ICP-OES	2 mg/kg
Hexavalent Chromium (Cr(VI))	Refer to IEC 62321:2008 Ed.1 Annex B	UV-Vis	/
	Refer to IEC 62321:2008 Ed.1 Annex C		2mg/kg
Polybrominated Biphenyls (PBBs)	Refer to IEC 62321:2008 Ed.1 Annex A	GC-MS	5 mg/kg
Polybrominated DiphenylEthers (PBDEs)			

Test Process :

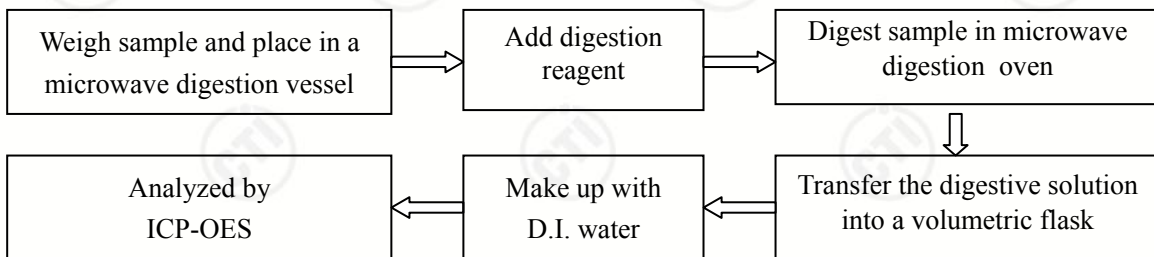
1.Test for Pb/Cd Content.



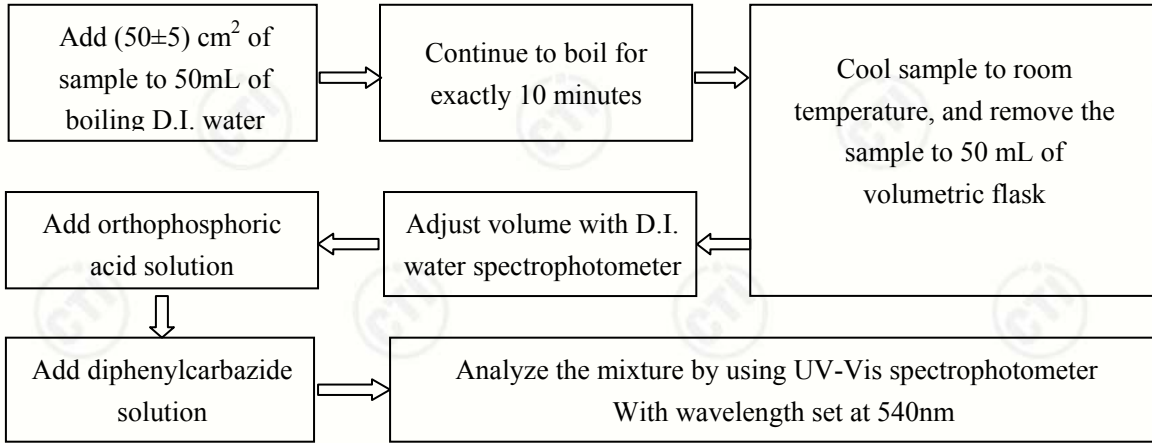
2.Test for Pb/Cd Content.



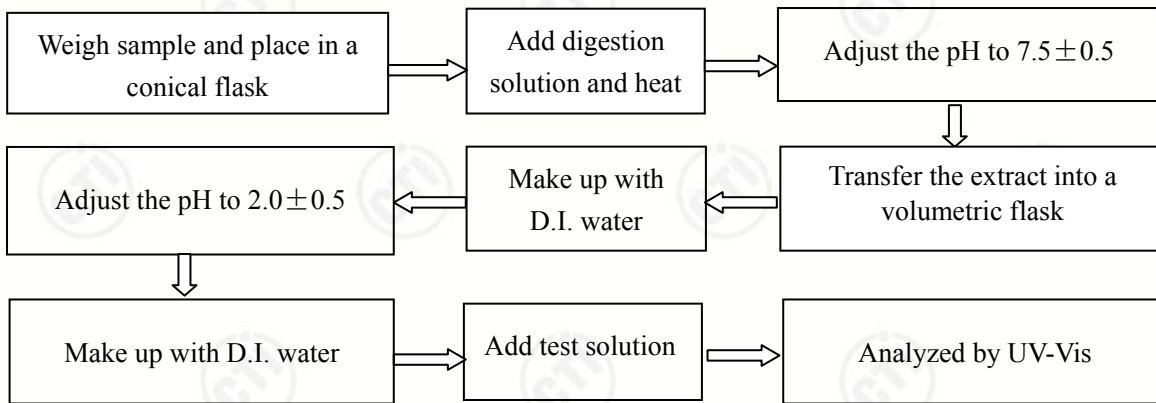
3. Test for Hg Content.



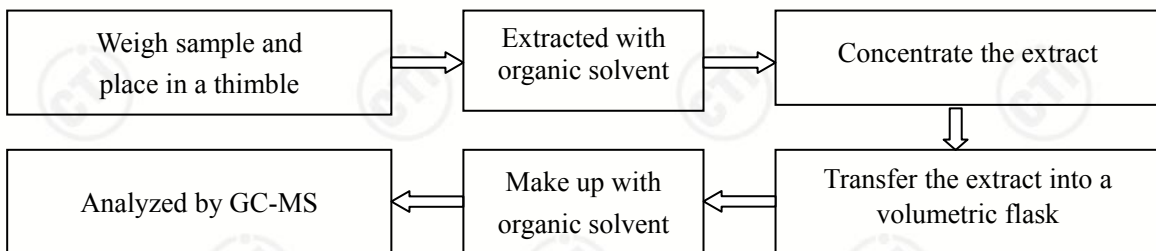
4. Test for Cr(VI) Content.



5. Test for Cr(VI) Content.



6. Test for PBBs /PBDEs Content.



1. XRF Test Result(s)

No.	Test Components Description(s)	Test Item(s) (Unit: mg/kg)				
		Pb	Cd	Hg	Cr	Br
1	Front cover	2.1×10 ¹	N.D.	N.D.	N.D.	N.D.
2	Axis tube	1.5×10 ²	N.D.	N.D.	2.6×10 ²	N.D.
3	Shell	1.3×10 ²	N.D.	N.D.	N.D.	N.D.
4	Magnet	3.2×10 ¹	N.D.	5.4×10 ¹	4.2×10 ²	1.0×10 ¹
5	Supporting spring	3.8×10 ²	N.D.	N.D.	/	N.D.
6	Enameled	6.2×10 ¹	N.D.	N.D.	5.9×10 ¹	N.D.
7	Shaft	2.1×10 ²	N.D.	N.D.	/	N.D.
8.1	Green solid with black ink	N.D.	N.D.	N.D.	1.6×10 ¹	1.3×10 ²
8.2	Copper metal	5.4×10 ¹	N.D.	N.D.	1.4×10 ²	N.D.
9	Dynamo sheet	N.D.	N.D.	N.D.	1.7×10 ²	N.D.
10	Insulation plate	2.9×10 ¹	N.D.	2.4×10 ¹	2.3×10 ¹	/
11	Insulation paper	1.0×10 ¹	N.D.	N.D.	N.D.	N.D.
12	Cotton thread	N.D.	N.D.	N.D.	N.D.	N.D.
13	Balancing sludge	N.D.	1.1×10 ¹	N.D.	N.D.	N.D.
14.1	Black plastic	N.D.	N.D.	N.D.	N.D.	5.3×10 ¹
14.2	Paper with black ink	N.D.	N.D.	N.D.	N.D.	5.5×10 ¹
15	Connected plate	1.6×10 ²	N.D.	N.D.	1.3×10 ²	N.D.
16	Spring	N.D.	N.D.	N.D.	/	N.D.
17	Carbon brush	7.2×10 ¹	N.D.	N.D.	5.6×10 ¹	N.D.
18	Leading wire	N.D.	N.D.	N.D.	N.D.	N.D.
19	Bushing	N.D.	N.D.	N.D.	N.D.	N.D.
20.1	Red wire skin	1.3×10 ¹	N.D.	N.D.	7.3×10 ¹	N.D.
20.2	Silver metal wire	N.D.	N.D.	N.D.	N.D.	N.D.
20.3	Black wire skin	N.D.	N.D.	N.D.	N.D.	N.D.
20.4	Silver metal wire	N.D.	N.D.	N.D.	N.D.	N.D.
21	Screw M5×110	1.3×10 ²	N.D.	N.D.	/	N.D.
22	Spring washer	1.3×10 ²	N.D.	N.D.	2.2×10 ²	N.D.
23	Nut M5	N.D.	N.D.	N.D.	/	N.D.
24	“E” rings	1.9×10 ²	N.D.	N.D.	4.2×10 ²	N.D.
25	Circlips for shaft	1.9×10 ²	N.D.	N.D.	4.2×10 ²	N.D.
26.1	Black rubber	1.7×10 ¹	N.D.	N.D.	4.9×10 ¹	N.D.

No.	Test Components Description(s)	Test Item(s) (Unit: mg/kg)				
		Pb	Cd	Hg	Cr	Br
26.2	Silver grey metal	6.4×10 ¹	N.D.	N.D.	1.2×10 ²	N.D.
26.3	Silver metal	N.D.	N.D.	N.D.	/	N.D.
26.4	Silver metal	1.4×10 ²	N.D.	N.D.	/	N.D.
26.5	Silver metal ball	N.D.	N.D.	N.D.	/	N.D.
26.6	Yellow plastic	N.D.	N.D.	N.D.	N.D.	N.D.
26.7	lubricating oil	N.D.	N.D.	N.D.	N.D.	N.D.
27	Rating label	1.1×10 ¹	N.D.	N.D.	N.D.	N.D.
28	Terminal	2.3×10 ²	N.D.	N.D.	5.4×10 ¹	N.D.
29	Top cover	N.D.	N.D.	N.D.	N.D.	4.8×10 ¹
30	Liquid room	5.0×10 ¹	N.D.	N.D.	N.D.	1.1×10 ²
31	Septum room	N.D.	N.D.	N.D.	N.D.	31×10 ¹
32	Septum patch	1.1×10 ¹	N.D.	N.D.	1.8×10 ¹	N.D.
33	Piston	N.D.	N.D.	N.D.	N.D.	3.5×10 ¹
34	Regulating valve	N.D.	N.D.	N.D.	1.4×10 ¹	N.D.
35	Regulating valve plate	N.D.	N.D.	N.D.	1.6×10 ¹	N.D.
36	Eccentric wheel	N.D.	N.D.	N.D.	N.D.	4.2×10 ¹
37	Piston bracket	N.D.	N.D.	N.D.	N.D.	4.8×10 ¹
38.1	Black plastic	5.0×10 ¹	N.D.	N.D.	N.D.	1.1×10 ²
38.2	Silver metal	4.7×10 ²	N.D.	N.D.	/	N.D.
39	Discharge check valve	1.0×10 ¹	N.D.	N.D.	2.2×10 ¹	N.D.
40	Inhalation check valve	1.0×10 ¹	N.D.	N.D.	2.2×10 ¹	N.D.
41	Cover for vent check valve	N.D.	N.D.	N.D.	1.9×10 ¹	N.D.
42	“O” ring	N.D.	N.D.	N.D.	1.6×10 ¹	N.D.
43	Outlet stopple	N.D.	N.D.	N.D.	7.1×10 ¹	N.D.
44	Shock absorption foot	N.D.	N.D.	N.D.	N.D.	N.D.
45	Regulating spring	N.D.	N.D.	N.D.	/	N.D.
46	Screw M5×30	N.D.	N.D.	N.D.	/	N.D.
47	Screw M5×40	N.D.	N.D.	N.D.	/	N.D.
48	Self threading screw	N.D.	N.D.	N.D.	/	N.D.
49	Screw M5×8	N.D.	N.D.	N.D.	/	N.D.
50	Self threading screw	N.D.	N.D.	N.D.	/	N.D.
51	Nut M5	N.D.	N.D.	N.D.	/	N.D.

No.	Test Components Description(s)	Test Item(s) (Unit: mg/kg)				
		Pb	Cd	Hg	Cr	Br
52	Spring washer	N.D.	N.D.	N.D.	/	N.D.
53	Main bracket	N.D.	N.D.	N.D.	N.D.	N.D.
54	Bearing cover	/	N.D.	N.D.	4.7×10^2	N.D.
55	Small label	1.1×10^1	N.D.	N.D.	N.D.	N.D.
56	Small "O" ring	N.D.	N.D.	N.D.	1.6×10^1	N.D.
57	Sell fitting	N.D.	N.D.	N.D.	1.6×10^1	N.D.
58	Top cover seal fitting	N.D.	N.D.	N.D.	1.6×10^1	N.D.
59	Translucent rubber	N.D.	N.D.	N.D.	N.D.	N.D.
60.1	Blue wire skin	1.0×10^1	N.D.	N.D.	4.1×10^1	N.D.
60.2	Silver metal wire	1.3×10^2	N.D.	1.2×10^2	N.D.	N.D.
61	Silver metal	1.3×10^2	N.D.	N.D.	4.8×10^2	N.D.
62	Silver metal	1.2×10^2	N.D.	N.D.	/	N.D.

Note: Testing results are only used for reference.

N.D. = Not Detected (Nonmetal<10mg/kg,Metal<50mg/kg)

2. Chemistry Test Result(s)

No.	Test Components Description(s)	Test Item(s) (Unit: mg/kg)					
		Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs
5	Supporting spring	/	/	/	Negative	/	/
7	Shaft	/	/	/	Negative	/	/
10	Insulation plate	/	/	/	/	N.D.	9PBDE:74 10PBDE:118
16	Spring	/	/	/	Negative	/	/
21	Screw M5×110	/	/	/	Negative	/	/
23	Nut M5	/	/	/	Negative	/	/
26.3	Silver metal	/	/	/	Negative	/	/
26.4	Silver metal	/	/	/	Negative	/	/
26.5	Silver metal ball	/	/	/	Negative	/	/
38.2	Silver metal	/	/	/	Negative	/	/
45	Regulating spring	/	/	/	Negative	/	/
46	Screw M5×30	/	/	/	Negative	/	/
47	Screw M5×40	/	/	/	Negative	/	/
48	Self threading screw	/	/	/	Negative	/	/
49	Screw M5×8	/	/	/	Negative	/	/
50	Self threading screw	/	/	/	Negative	/	/
51	Nut M5	/	/	/	Negative	/	/
52	Spring washer	/	/	/	Negative	/	/
54	Bearing cover	8	/	/	/	/	/
62	Silver metal	/	/	/	Negative	/	/
limit	Pb≤1000mg/kg Cd≤100mg/kg Hg≤1000mg/kg Cr(VI)≤1000mg/kg PBBs≤1000mg/kg PBDEs≤1000mg/kg						

Note: The sample had been dissolved totally tested for Lead, Cadmium, Mercury.

-mg/kg = ppm = Parts Per Million,

N.D. = Not Detected (<Report Limit).

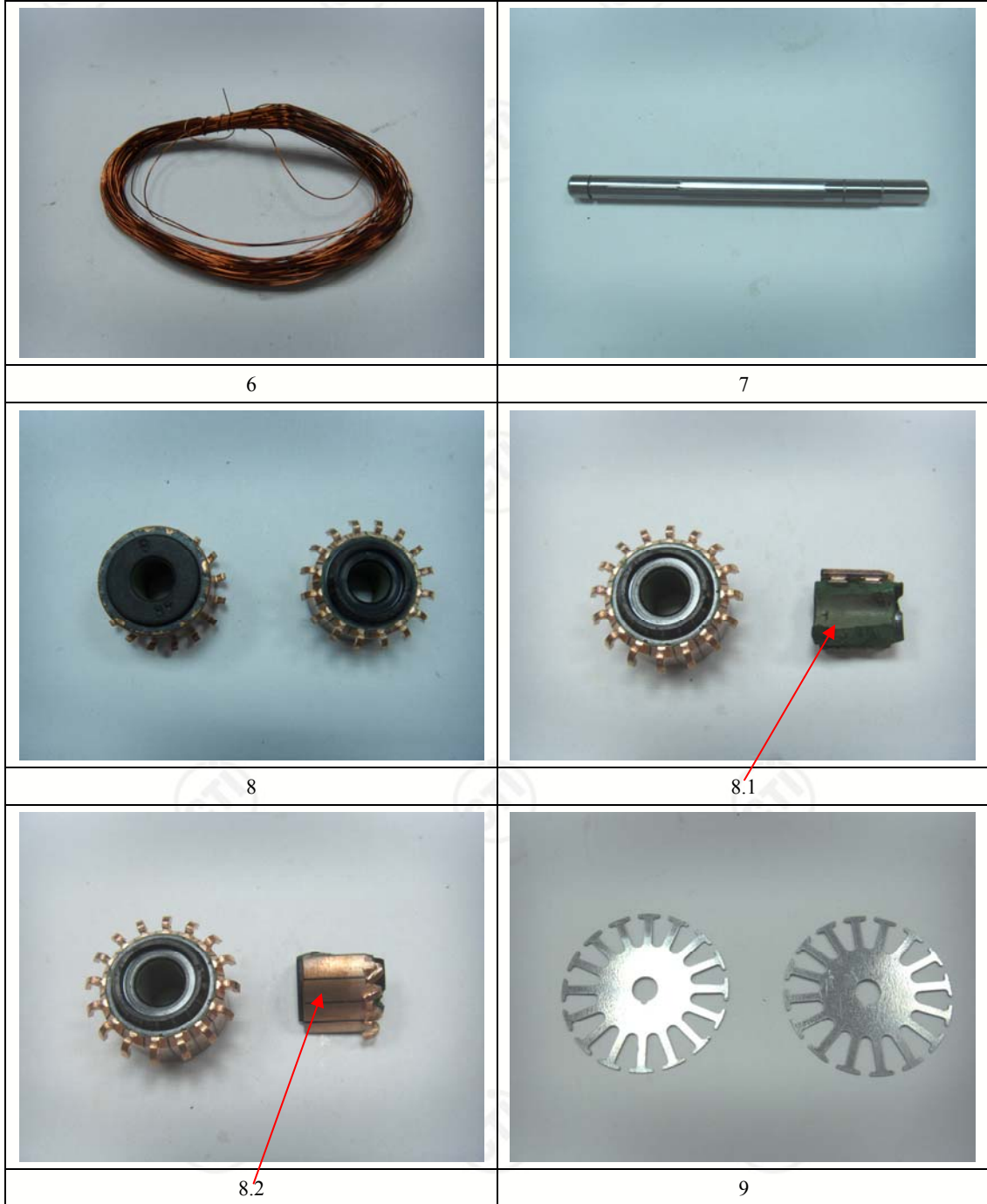
-Negative = Absence of Cr(VI)

Photo of the sample

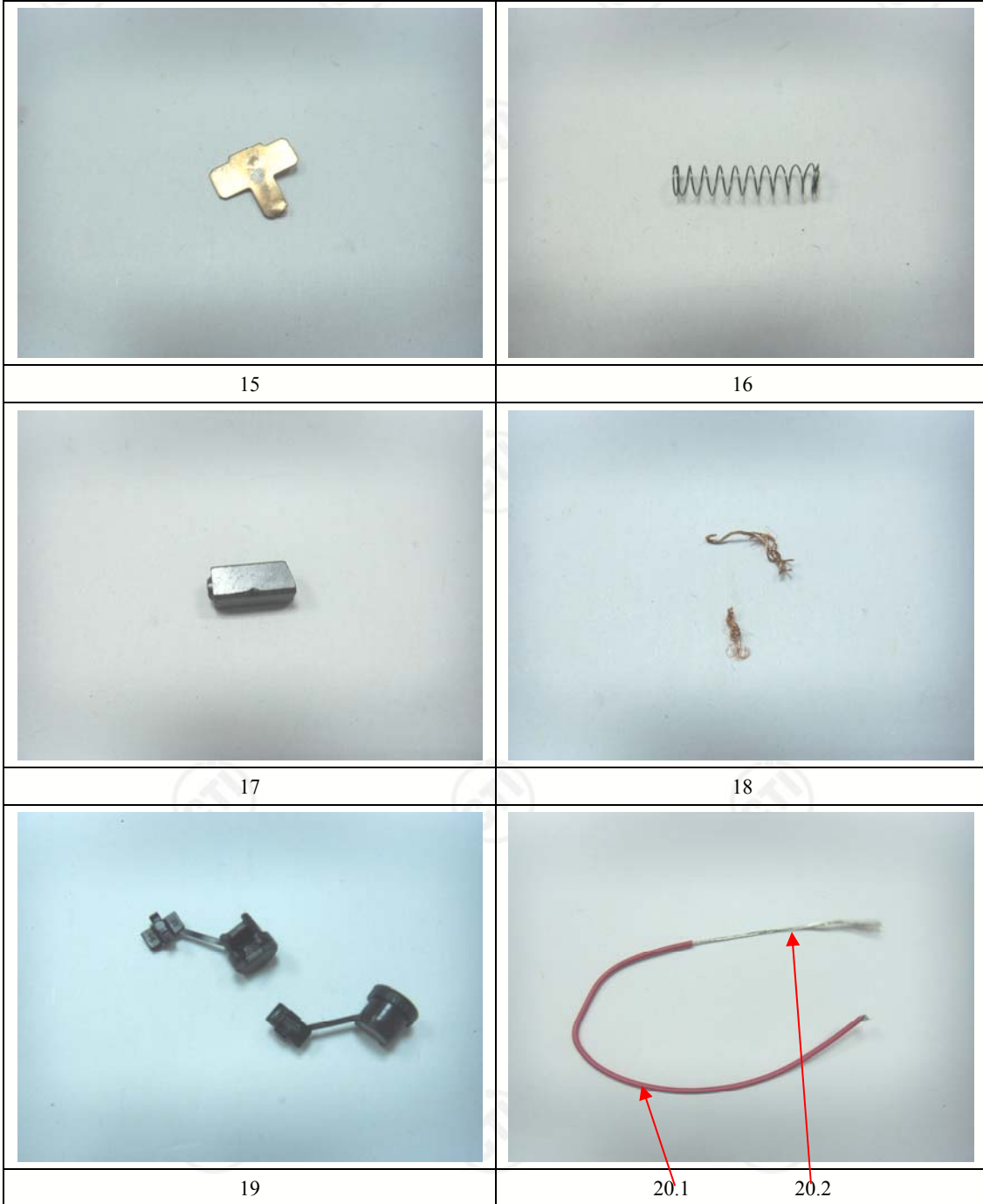


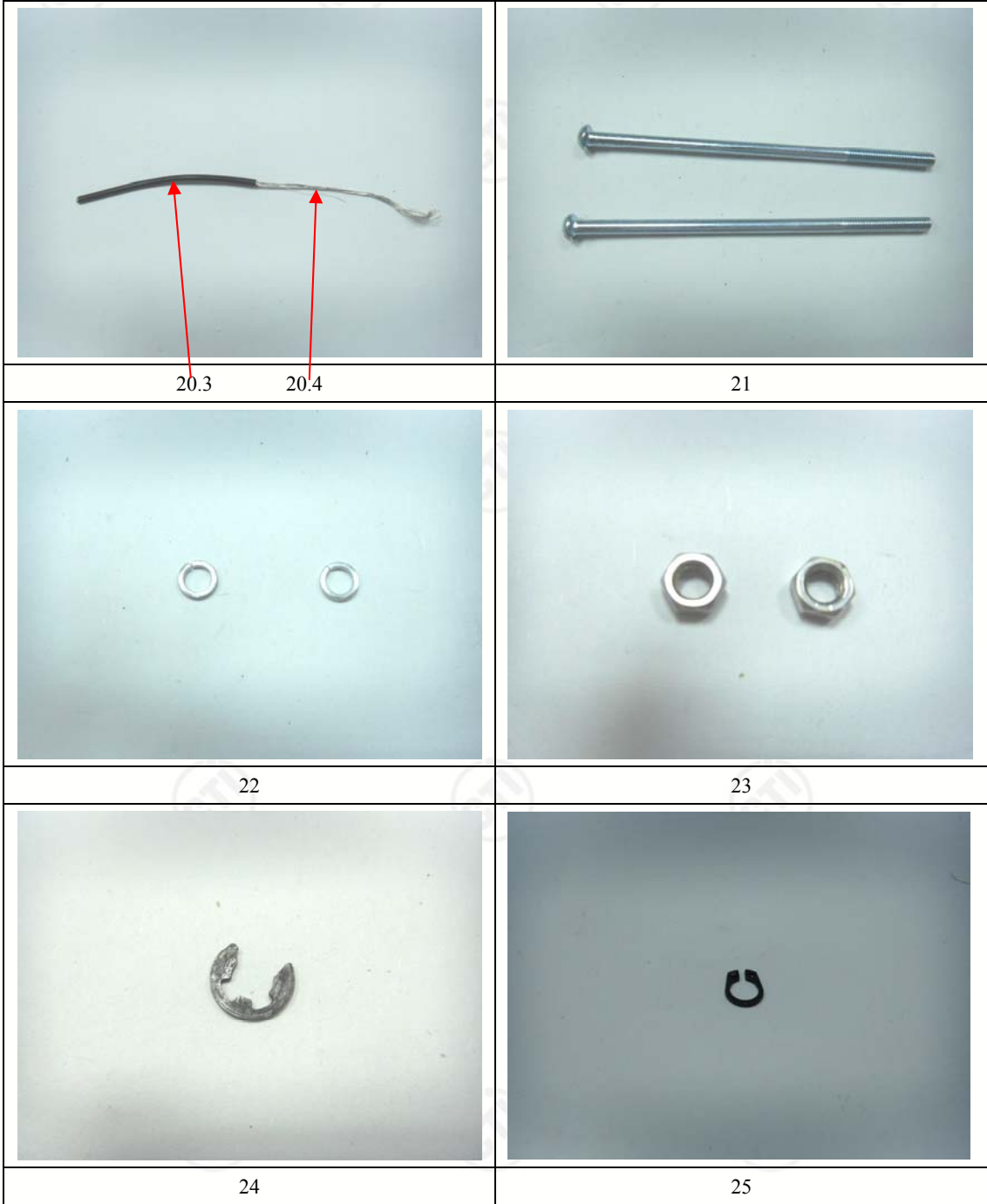
Photos of Test Components

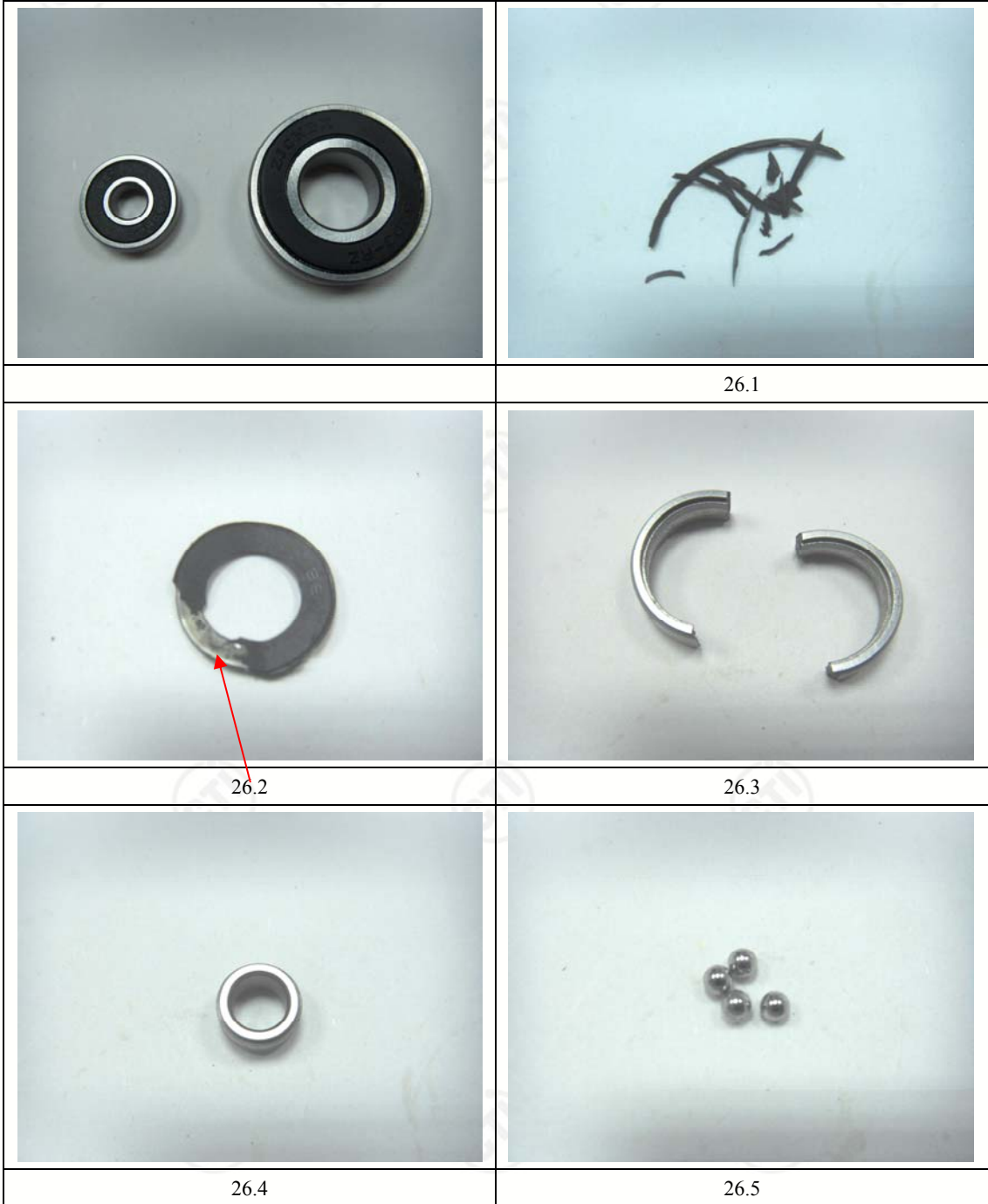






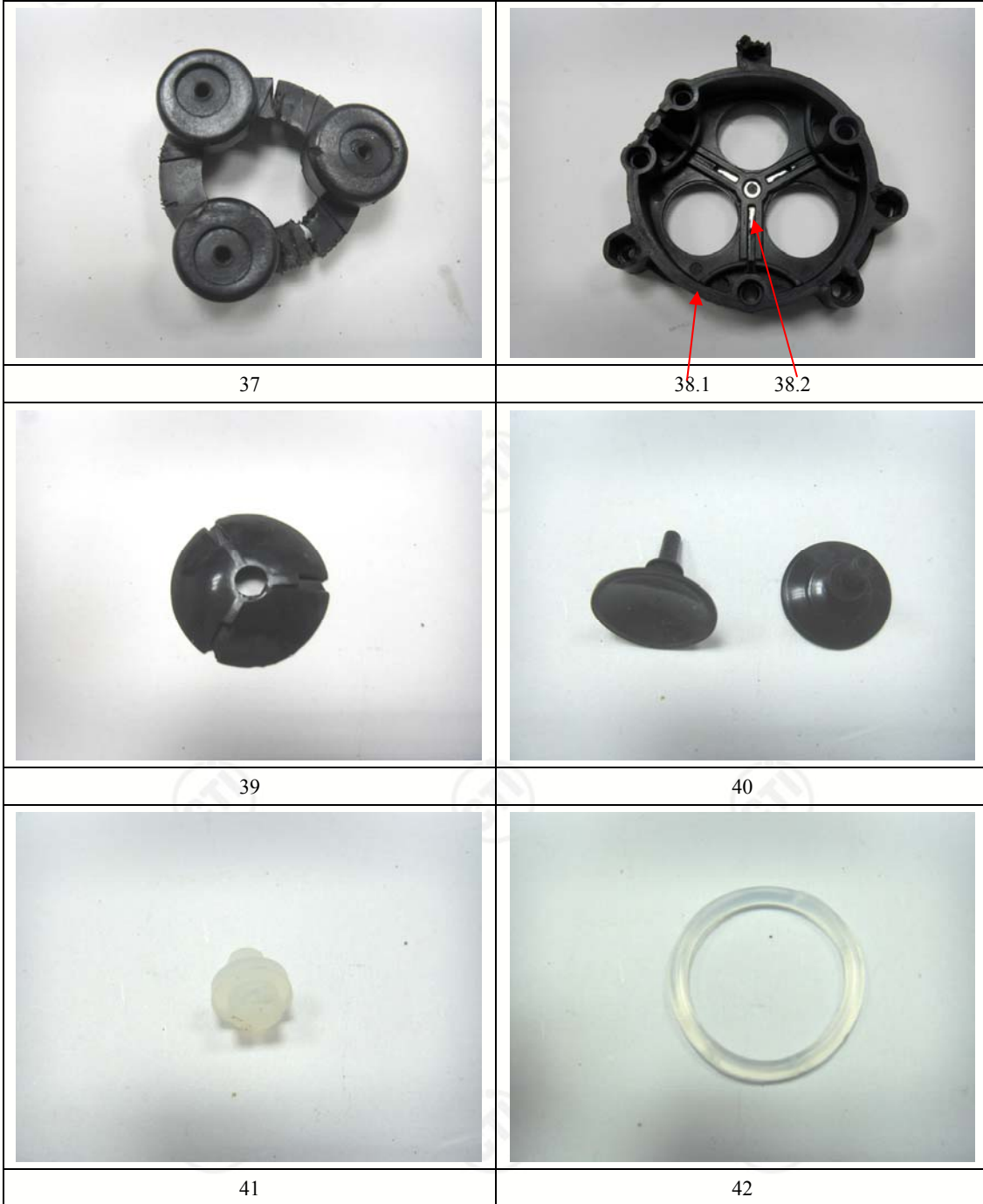


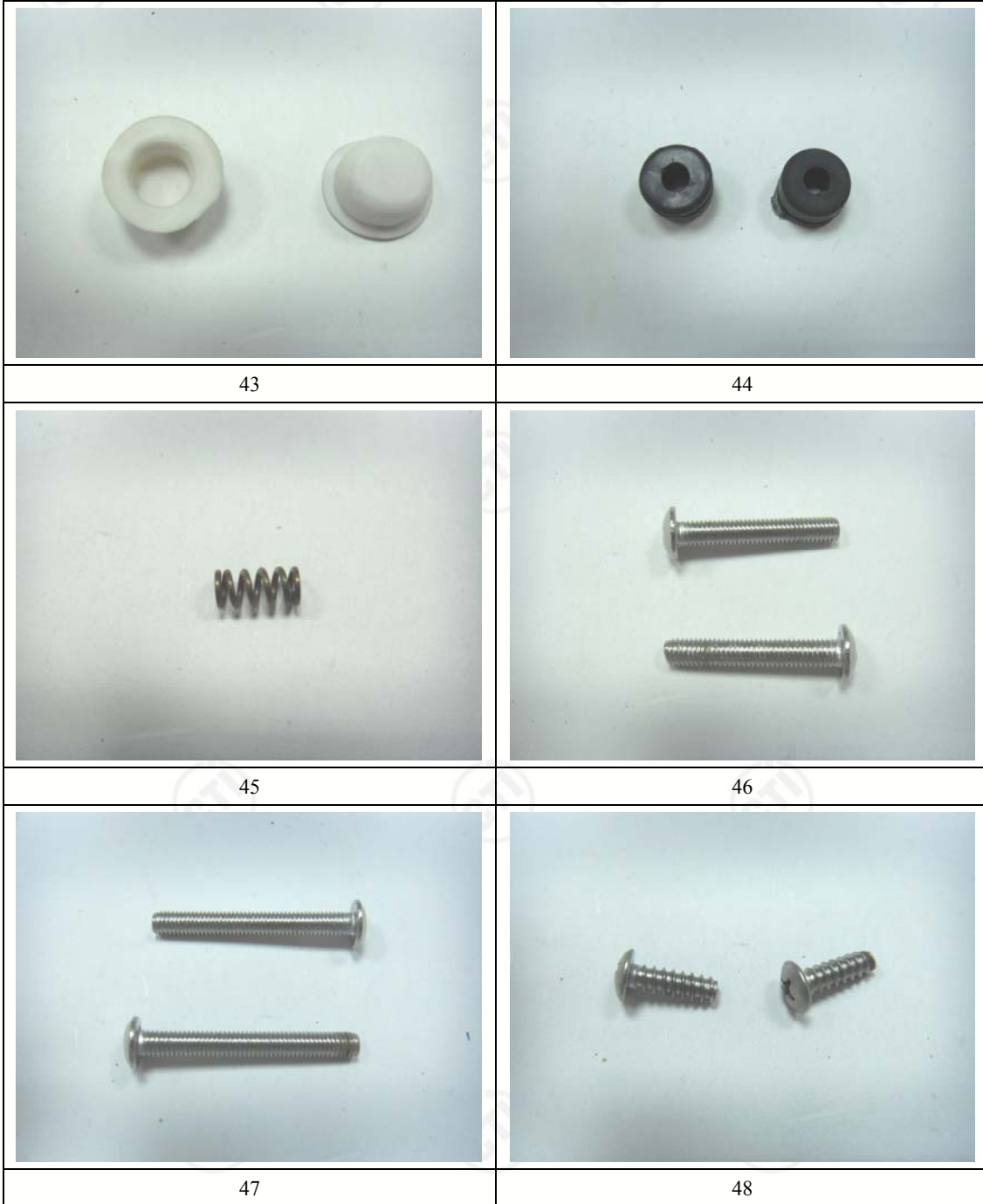


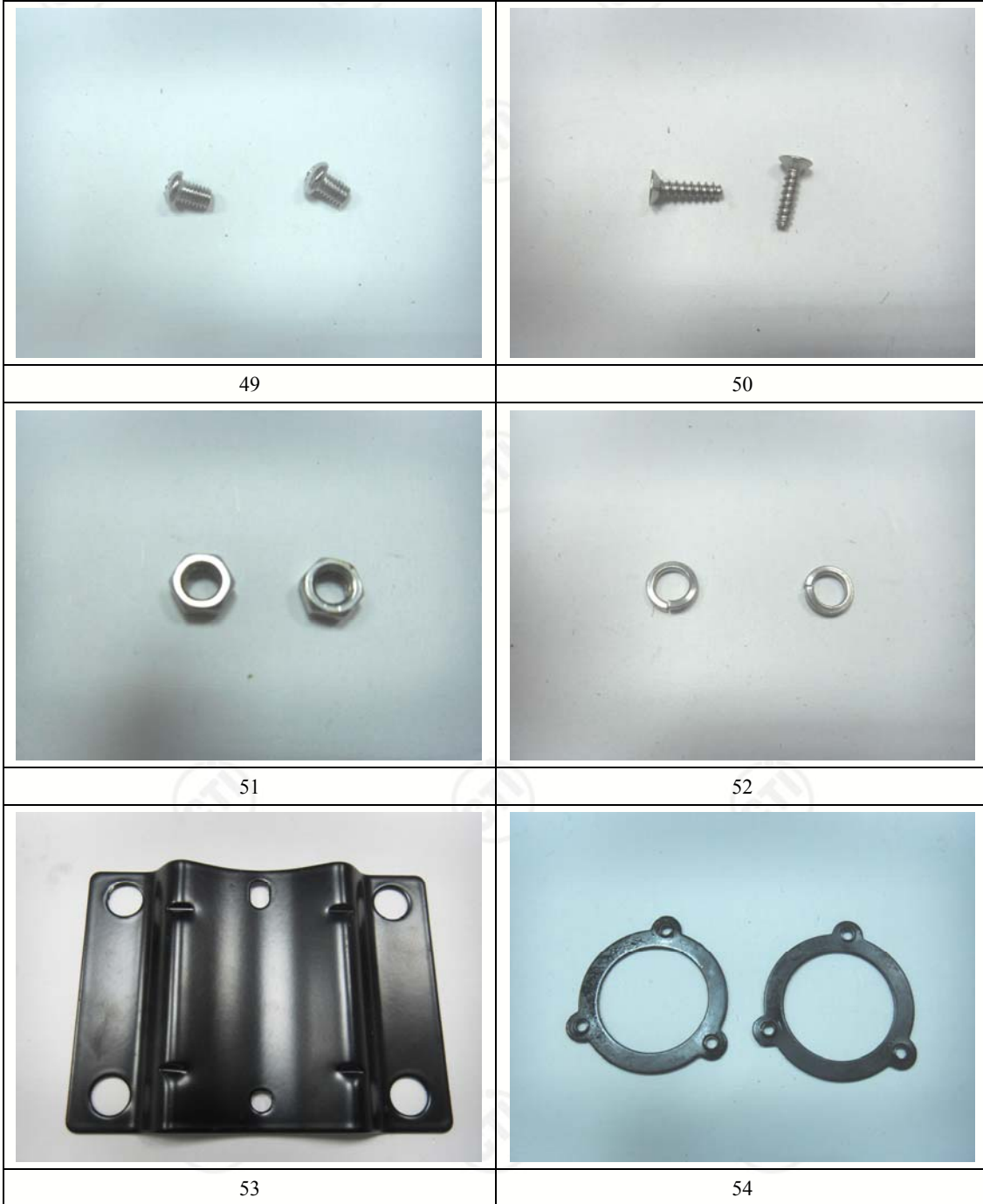


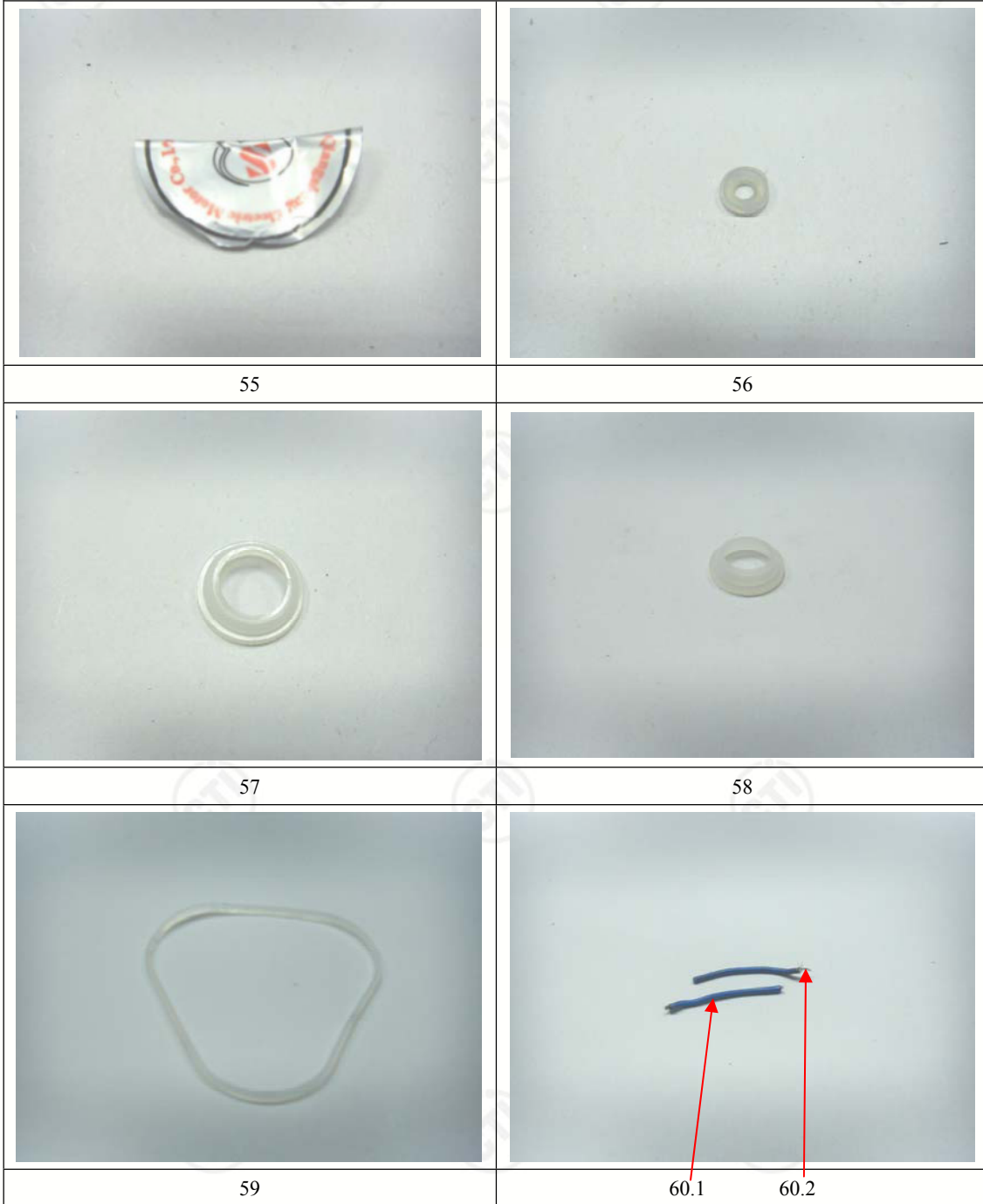


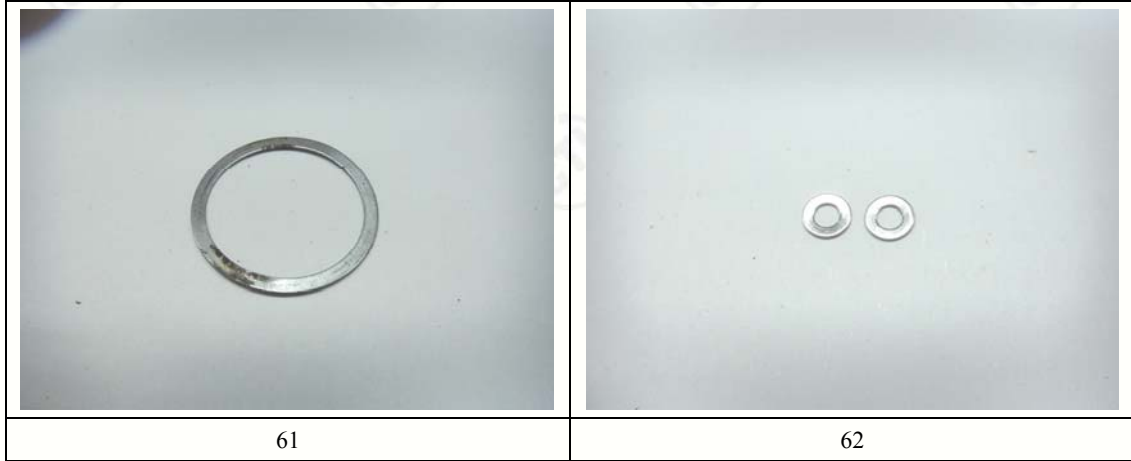












*** End of report ***

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RoHS指令豁免项目

Exempted Items of RoHS Directive

欧盟委员会针对豁免材料陆续发布了 8 次决议，分别是：2002/95/EC、2005/717/EC、2005/747/EC、2006/310/EC、2006/690/EC、2006/691/EC、2006/692/EC 和 2008/385/EC，这些决议中的豁免共计 32 项：

The Commission of the European Communities have issued eight commission decision about the exemptions. They are 2002/95/EC、2005/717/EC、2005/747/EC、2006/310/EC、2006/690/EC、2006/691/EC、2006/692/EC and 2008/385/EC. There are 32 exemption items altogether.

1. Mercury in compact fluorescent lamps not exceeding 5 mg per lamp.
小型荧光灯中的汞，汞含量不超过 5mg/灯。
2. Mercury in straight fluorescent lamps for general purposes not exceeding:
普通用途直荧光灯中的汞，汞含量不超过：
 - Halophosphate 10 mg;
盐磷酸盐 10mg.
 - Triphosphate with normal lifetime 5 mg;
普通寿命的三磷酸盐 5mg
 - Triphosphate with long lifetime 8 mg.
长寿命的三磷酸盐 8mg
3. Mercury in straight fluorescent lamps for special purposes.
特殊用途直荧光灯中的汞
4. Mercury in other lamps not specifically mentioned in this Annex.
本附录未明确提出的其他灯具中的汞
5. Lead in glass of cathode ray tubes, electronic components and fluorescent tubes.
阴极射线管，电子元件以及荧光管的玻璃中的铅

RoHS指令豁免项目

Exempted Items of RoHS Directive

6. Lead as an alloying element in:
铅作为合金元素在:
 - Steel containing up to 0.35 % lead by weight;
钢里, 铅的重量含量不超过 0.35 %
 - Aluminium containing up to 0.4 % lead by weight;
铝里, 铅的重量含量不超过 0.4%
 - Copper alloy containing up to 4 % lead by weight.
铜合金里, 铅的重量含量不超过 4%
7. Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead).
用于高温融化焊料中的铅 (即: 锡铅焊料合金中铅含量超过 85%)
Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission as well as network management for telecommunication.
用于服务器, 存储器和存储系统中的铅, 用于交换, 信号和传输, 以及电信网络管理的网络基础设施设备中焊料中的铅。
Lead in electronic ceramic parts (e.g. piezoelectronic devices).
电子陶瓷产品中的铅 (如: 高压电子装置)
8. Cadmium and its compounds in electrical contacts and cadmium plating except for applications banned under Directive 91/338/EEC amending Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations.
根据修改关于限制特定危险物质和与制品销售和使用的第 76/769/EEC 号指令的 91/338/EEC 号指令禁止以外的电气触点和镉电镀。
9. Hexavalent chromium as an anti-corrosion of the carbon steel cooling system in absorption refrigerators.
在吸收式电冰箱中作为碳钢冷却系统防腐剂的六价铬。

RoHS指令豁免项目

Exempted Items of RoHS Directive

10. Lead in lead-bronze bearing shells and bushes.
用于铅铜合金轴承和衬套中的铅。
11. Lead used in compliant pin connector systems.
顺应针连接器系统中的铅。
12. Lead as a coating material for the thermal conduction module c-ring.
用于热传导模块 C-环的被覆材料中的铅。
13. Lead and cadmium in optical and filter glass.
用于光学及滤波器玻璃中的铅和镉。
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.
微处理器针脚及封装联接所使用的含两种以上组分的焊料中的铅（铅含量在 80%与 85%之间）。
15. Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages.
集成电路倒装芯片封装中半导体芯片及载体之间形成可靠联接所用焊料中的铅。
16. Lead in linear incandescent lamps with silicate coated tubes.
用于带有硅酸盐灯管的线型白炽灯中的铅。
17. Lead halide as radiant agent in High Intensity Discharge (HID) lamps used for professional reprography applications.
用在专业复印领域高强度放电灯(HID)做激发介质中的卤素铅。
18. 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) as well as when used as speciality lamps for diazo-printing reprography, lithography, insect traps, photochemical and curing processes containing phosphors such as SMS ((Sr,Ba)2MgSi2O7:Pb).
放电管的荧光粉中作为催化剂的铅（铅的重量小于等于 1%）可以豁免，当放电管用于含有磷元素（如 BSP (BaSi2O5:Pb)）的日晒灯时，以及用于重氮印刷、平板印刷、捕虫、光化学、固化工艺等等专业领域的灯具时。

RoHS指令豁免项目

Exempted Items of RoHS Directive

19. Lead with PbBiSn-Hg and PbInSn-Hg in specific compositions as main amalgam and with PbSn-Hg as auxiliary amalgam in very compact Energy Saving Lamps (ESL).
小型节能灯中作为主要汞合金的特定的 PbBiSn-Hg 和 PbInSn-Hg 中的铅，以及作为辅助汞合金的 PbSn-Hg 中的铅。
20. Lead oxide in glass used for bonding front and rear substrates of flat fluorescent lamps used for Liquid Crystal Displays (LCD).
LCD 的平板荧光灯前后基板键合时所用玻璃中的铅。
21. Lead and cadmium in printing inks for the application of enamels on borosilicate glass.
用在硅硼玻璃表面瓷釉上的印刷油墨中的铅和镉；
22. Lead as impurity in RIG (rare earth iron garnet) Faraday rotators used for fibre optic communications systems.
在光纤通讯系统中的稀土铁石榴石法拉第旋转器中的杂质铅；
23. Lead in finishes of fine pitch components other than connectors with a pitch of 0.65 mm or less with NiFe lead frames and lead in finishes of fine pitch components other than connectors with a pitch of 0.65 mm or less with copper lead frames.
小螺距零部件表面处理中的铅（螺距不超过 0.65mm 且带镍铁边框的连接器，以及螺距不超过 0.65mm 且带铜边框的连接器不在豁免之内）
24. Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors.
通过盘状及平面陈列陶瓷多层电容器的焊料所含的铅；

RoHS指令豁免项目

Exempted Items of RoHS Directive

25. Lead oxide in plasma display panels (PDP) and surface conduction electron emitter displays (SED) used in structural elements; notably in the front and rear glass dielectric layer, the bus electrode, the black stripe, the address electrode, the barrier ribs, the seal frit and frit ring as well as in print pastes.
等离子显示屏（PDP）及表面传导式电子发射显示器（SED）构件中所用的氧化铅，特别是在玻璃前后绝缘层中所用的氧化铅、总线电极中的氧化铅、黑条（彩色显像管）中的氧化铅、地址电极中的氧化铅、阻挡层肋柱的氧化铅、密封玻璃料中的氧化铅，以及封装玻璃中的氧化铅、环状玻璃中的氧化铅、印墨中的氧化铅；
26. Lead oxide in the glass envelope of Black Light Blue (BLB) lamps.
黑蓝灯（BLB）玻璃封装中的氧化铅；
27. Lead alloys as solder for transducers used in high-powered (designated to operate for several hours at acoustic power levels of 125 dB SPL and above) loudspeakers.
用作大功率扬声器（用在长时间操作 125 分贝以上的音响系统）的传感器中焊料的铅合金。
29. Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC (*).
水晶玻璃中铅含量的限定依照欧盟指令 69/493/EEC 附件 I (第 1、2、3、4 类)。
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.
用于位于音压级 (SPL) 大于或等于 100 分贝的大功率扬声器音圈上的电导体的电气/机械 Welding spot 的镉合金。
31. Lead in soldering materials in mercury free flat fluorescent lamps (which e. g. are used for liquid crystal displays, design or industrial lighting).
用于无汞平板荧光灯（例如：用于液晶显示器、设计或工业照明）的焊料中的铅。

RoHS指令豁免项目

Exempted Items of RoHS Directive

32. Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes.

用于氩和氙激光管防护窗组合件的封装玻璃料里的铅的氧化物。

注:

- 1: 依照欧盟决议 2006/692/EC, 第 28 条豁免项目将在 2007 年 7 月 1 日中止。原第 28 条项目为: 用于防腐或屏蔽电磁干扰, 用在特定仪器设备中 (欧盟指令 2002/96/EC 第三类规定的 IT 和通讯设备) 的金属片或金属扣件上的防腐涂层中的六价铬。

According to the commission decision 2006/692/EC of the European communities, the 28th exemption item of Directive 2002/95/EC had been terminated. The 28th exemption item of Directive 2002/96/EC said:

“ Hexavalent chromium in corrosion preventive coatings of unpainted metal sheeting and fasteners used for corrosion protection and Electromagnetic Interference shielding in equipment falling under category three of Directive 2002/96/EC.Exemption granted until 1 July 2007” .

- 2: 2008 年 4 月 1 日, 欧洲法院 (European Court of Justice) 发布公告: 欧盟委员会 2005 年公布的针对十溴二苯醚的豁免项目存在程序性的错误, 因此废除委员会决议 2005/717/EC 对聚合物中十溴二苯醚的豁免。

The exemption of DecaBDE in polymetric application according 2005/717/EC was overruled by the European Court of Justice by it decision of 01.04.2008.

- 3: 以上豁免项目, 若中文译文与英文原文意思上不一致, 以英文原文为准。

The above exemptions item, if the Chinese translation is inconsistent with the English meaning of the original text , the English original shall prevail.