

**Report No.:** 244591707a 001

Page 1 of 10

**Client:** SHENGZHOU SHENGHUA MACHINERY TECHNOLOGY CO., LTD.

**Contact Information:** No.7 Dragon Road, Huangze Industrial Area, Shengzhou City, Zhejiang,  
P.R. China

**Identification/** Control Unit SHD70

**Model No(s):**

**Condition at delivery:** Test item complete and undamaged.

**Sample Receiving date:** 2024-01-29

**Testing Period:** 2024-01-29 to 2024-03-05

**Place of testing:** Chemical laboratory Shanghai

**Test Specification:**

**Test result:**

1. Screening Test by XRF Spectroscopy  
According to RoHS (recast): Restriction of the Use of Certain Hazardous  
Substances in Electrical and Electronic Equipment, 2011/65/EU Annex II and  
its amendment.

PASS

For and on behalf of  
TÜV Rheinland (Shanghai) Co., Ltd.



2024-03-25

Ryan Chen / Section Manager

*Date*

*Name/Position*

Sample information is provided by customer. Test result is drawn according to the kind and extent of tests performed.

This test report relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.

"Decision Rule" document announced in our website (<https://www.tuv.com/landingpage/en/qm-gcn/>) describes the statement of conformity and its rule of enforcement for test results are applicable throughout this test report.

**Test Report No.: 244591707a 001**

Page 2 of 10

**Material List:**

Item: Control Unit SHD70

Material No.	Material	Color	Location
M001	Plastic	black	refer to photo
M002	Plastic	black	refer to photo
M003	Plastic	white	refer to photo
M004	Metal	silver	refer to photo
M005	Metal	black	refer to photo
M006	Metal	silver	refer to photo
M007	Electronic components	grey/black	refer to photo
M008	Electronic components	dark green	refer to photo
M009	Metal	copper	refer to photo
M010	Glue	beige	refer to photo
M011	Plastic	black/golden	refer to photo
M012	Plastic + adhesive	yellow	refer to photo
M013	Magnet	dark grey	refer to photo
M014	Metal	silver	refer to photo
M015	Metal	silver	refer to photo
M016	Metal	silver	refer to photo
M017	Metal	silver	refer to photo
M018	Electronic components	brown	refer to photo
M019	Electronic components	blue/black	refer to photo
M020	Electronic components	black	refer to photo
M021	Electronic components	multi-colour	refer to photo
M022	Electronic components	black	refer to photo
M023	Electronic components	yellow	refer to photo
M024	Electronic components	black	refer to photo
M025	Electronic components	blue	refer to photo
M026	Electronic components	red	refer to photo
M027	Electronic components	black	refer to photo
M028	Electronic components	green	refer to photo
M029	Plastic	black/grey	refer to photo

**Test Report No.: 244591707a 001**

Page 3 of 10

M030	Metal	copper	refer to photo
M031	Metal	silver	refer to photo
M032	Metal	silver	refer to photo
M033	Metal	copper	refer to photo
M034	Solder	silver	refer to photo
M035	Plastic	brown	refer to photo
M036	Plastic	black	refer to photo
M037	Electronic components	black	refer to photo
M038	Electronic components	black	refer to photo
M039	Electronic components	black	refer to photo
M040	Electronic components	black	refer to photo
M041	Electronic components	black/white	refer to photo
M042	Electronic components	black	refer to photo
M043	Electronic components	black/white	refer to photo
M044	PCB board	green	refer to photo

**Test Report No.: 244591707a 001**

Page 4 of 10

**1.Screening Test by XRF spectroscopy**

Test Method: Cadmium, Lead, Mercury, Chromium, Bromine  
 -- With reference to IEC 62321-3-1:2013

**Test Result:**

Material No.	Cd	Cr	Pb	Hg	Br
M001	BL	BL	BL	BL	BL
M002	BL	BL	BL	BL	BL
M003	BL	BL	BL	BL	BL
M004	BL	BL	BL	BL	n.a.
M005	BL	d*1	BL	BL	n.a.
M006	BL	BL	BL	BL	n.a.
M007	BL	BL	BL	BL	BL
M008	BL	BL	BL	BL	BL
M009	BL	BL	BL	BL	n.a.
M010	BL	BL	BL	BL	BL
M011	BL	BL	BL	BL	BL
M012	BL	BL	BL	BL	BL
M013	BL	BL	BL	BL	n.a.
M014	BL	BL	BL	BL	n.a.
M015	BL	BL	BL	BL	n.a.
M016	BL	BL	BL	BL	n.a.
M017	BL	BL	BL	BL	n.a.
M018	BL	BL	BL	BL	BL
M019	BL	BL	BL	BL	BL
M020	BL	BL	BL	BL	BL
M021	BL	d*1	BL	BL	BL
M022	BL	BL	BL	BL	d*1
M023	BL	BL	BL	BL	d*1
M024	BL	BL	BL	BL	BL
M025	BL	BL	BL	BL	BL
M026	BL	BL	BL	BL	BL
M027	BL	BL	BL	BL	BL
M028	BL	BL	BL	BL	BL
M029	BL	BL	BL	BL	BL
M030	BL	BL	BL	BL	n.a.
M031	BL	BL	BL	BL	n.a.
M032	BL	BL	BL	BL	n.a.
M033	BL	BL	BL	BL	n.a.
M034	BL	BL	BL	BL	n.a.
M035	BL	BL	BL	BL	BL
M036	BL	BL	BL	BL	BL
M037	BL	BL	BL	BL	BL

**Test Report No.: 244591707a 001**

Page 5 of 10

M038	BL	BL	BL	BL	BL
M039	BL	BL	BL	BL	BL
M040	BL	BL	BL	BL	BL
M041	BL	BL	BL	BL	BL
M042	BL	BL	BL	BL	BL
M043	BL	BL	d*1	BL	n.a.
M044	BL	BL	BL	BL	d*1

**Abbreviation:**

Pb	=	Lead
Cd	=	Cadmium
Hg	=	Mercury
Cr	=	Chromium
Br	=	Bromine
n.a.	=	Not applicable
BL	=	Below limit
OL	=	Over limit
d.	=	Detected

**Remark:**

- (\*1) The screening result was detected in the inconclusive region or over limits, thus the further wet chemistry tests are suggested.
- (\*2) Component(s)/ materials(s) with an area of less than 2 mm x 2 mm will not be selected for testing according to RoHS Directive 2011/65/EU due to technical reason.  
For the test sample does not have detail materials information provided by client, visually identical materials (e.g. wire insulation, solder points, etc.) will be considered as the same material.  
Solder points on a printing circuit board will be examined several times based on optical anomalies or discoloration of the solder point(s) unless the solder point(s) is obviously generated automatically during production.  
All other materials will be sampled and tested at one test point representatively.
- (\*3) The Chromium (Cr) and Bromine (Br) in the above result table indicate the total chromium and total bromine by means of XRF screening. PBBs, or PBDEs content shall be further confirmed with reference to IEC 62321-6:2015. Chromium (VI) shall be further confirmed with reference to IEC 62321-7-1:2015, IEC 62321-7-2:2017 or EN ISO 17075-1:2017.

XRF Screening limits for different matrices :

Material	Concentration (%)				
	Cd	Cr	Pb	Hg	Br
<b>Polymeric</b>	BL≤0.006<X<0.014≤ OL	BL≤0.064<X	BL≤0.067<X<0.133≤ OL	BL≤0.066<X< 0.134≤OL	BL≤0.029<X
<b>Metallic</b>	BL≤0.006<X<0.014≤ OL	BL≤0.064<X	BL≤0.067<X<0.133≤ OL	BL≤0.066<X< 0.134≤OL	n.a.
<b>Composite materials</b>	BL≤0.004<X<0.016≤ OL	BL≤0.044<X	BL≤0.047<X<0.153≤ OL	BL≤0.046<X< 0.154≤OL	BL≤0.024<X

Remark: The symbol "X" marks the region where further investigation is necessary.

**Test Report No.: 244591707a 001**

Page 6 of 10

**Cadmium, Lead, Chromium (VI), Mercury, Polybrominated biphenyls (PBB) and Polybrominated diphenyl ethers (PBDE)**

Test Method: Total Cadmium, Lead, Mercury, Chromium  
 - Ref. to IEC 62321-4:2013+AMD1:2017 and IEC 62321-5:2013

Chromium (VI)  
 - For Metal material - Ref. to IEC 62321-7-1:2015  
 - For Polymer, Electronic material or others materials – Ref. to IEC 62321-7-2:2017

PBBs, PBDEs – Ref. to IEC 62321-6:2015

**Test Result:**

	<b>Cd</b>	<b>Cr(VI)</b>	<b>Pb</b>	<b>Hg</b>	<b>PBBs</b>	<b>PBDEs</b>
<b>Maximum Permissible Limit (%)</b>	0.01	0.1	0.1	0.1	0.1	0.1

<b>Material No.</b>	<b>(%)</b>					
	<b>Cd</b>	<b>Cr<sup>^</sup></b>	<b>Pb</b>	<b>Hg</b>	<b>PBBs</b>	<b>PBDEs</b>
	<b>RL (%)</b>					
	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	<b>0.01</b>	<b>0.01</b>
M022	n.a.	n.a.	n.a.	n.a.	< RL	0.03
M023	n.a.	n.a.	n.a.	n.a.	< RL	< RL
M043	n.a.	n.a.	0.164 7(c)-I	n.a.	n.a.	n.a.
M044	n.a.	n.a.	n.a.	n.a.	< RL	< RL

<b>Material No.</b>	<b>Chromium VI content for other materials (%) RL: 0.01%</b>
M005	< RL
M021	< RL

**Abbreviation:**

Pb	= Lead
Cd	= Cadmium
Hg	= Mercury
Cr	= Chromium
Cr (VI)	= Chromium (VI)
PBBs	= Total Polybrominated Biphenyls
PBDEs	= Total Polybrominated Diphenyl Ethers
<	= Less than
RL	= Reporting Limit
n.a.	= Not Applicable
<sup>^</sup>	= The total Chromium have been determined
%	= Percentage

**Test Report No.: 244591707a 001**

Page 7 of 10

**Remark:**

- (\*1) The Chromium (VI) content of metal sample in surface layer have been confirmed with reference to IEC 62321-7-1:2015 Annex.

	Chromium (VI) concentration	Qualitative result
Negative	$<0.1\mu\text{g}/\text{cm}^2$	The sample is negative (-ve) for Cr(VI). The Cr(VI) concentration is below the limit of quantification. The coating is considered a non-Cr(VI) based coating
Inconclusive	$\geq 0.1\mu\text{g}/\text{cm}^2$ and $\leq 0.13\mu\text{g}/\text{cm}^2$	The result is considered to be inconclusive. Unavoidable coating variations may influence the determination. Recommendation: if additional samples are available, perform a total of 3 trials to increase sampling surface area. Use the averaged result of the 3 trials for the final determination.
Positive	$>0.13\mu\text{g}/\text{cm}^2$	The sample is positive (+ve) for Cr(VI). Concentration is above the limit of quantification and the statistical margin of error. The sample coating is considered to contain Cr(VI).

- 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 compound.

**Test Report No.: 244591707a 001**

Page 8 of 10

**BBP, DBP, DEHP, DIBP content**

Test Method: ref. to IEC 62321-8:2017

**Test Result:**

	BBP	DBP	DEHP	DIBP
Maximum permissible Limit (%)	0.1	0.1	0.1	0.1

Test No.	Material No.	RL (%)			
		BBP	DBP	DEHP	DIBP
		RL (%)			
		0.005	0.005	0.005	0.005
T001	M001 + M036	< RL	< RL	< RL	< RL

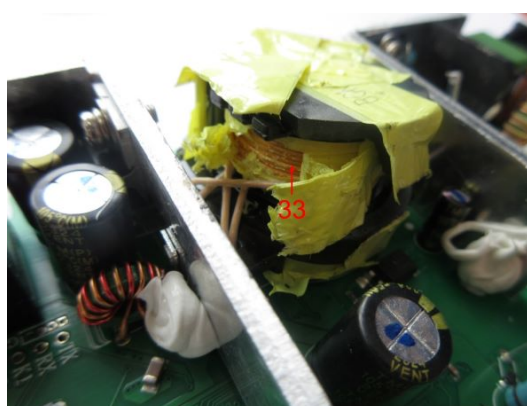
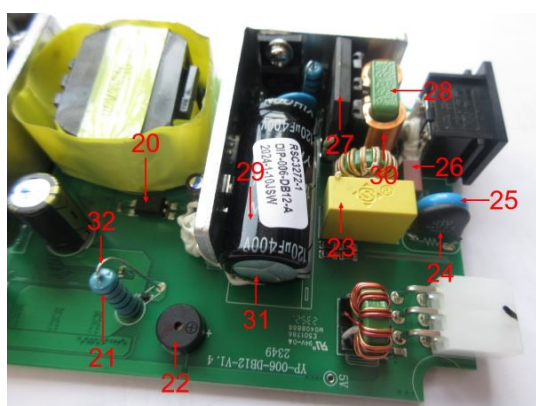
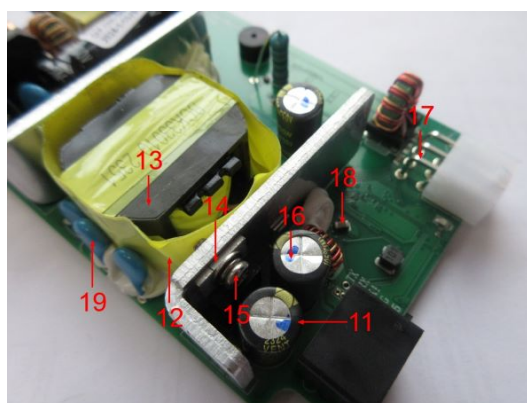
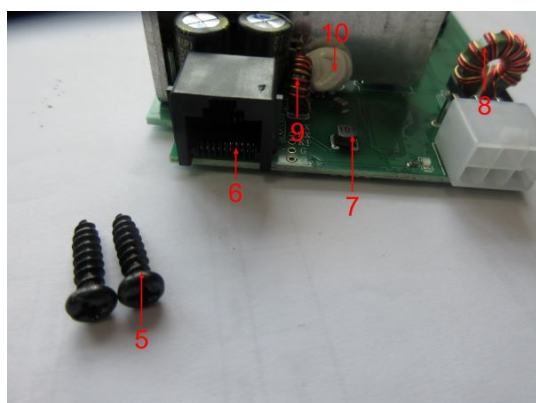
**Abbreviation:** BBP= Benzylbutyl phthalate  
 DBP= Dibutyl phthalate  
 DEHP= Bis(2-ethylhexyl) phthalate  
 DIBP= Diisobutyl phthalate  
 < = less than  
 RL = Reporting Limit  
 %= percentage

**Remark:**

- \* The maximum permissible limit is required from the amendment (EU) 2015/863 of RoHS Directive 2011/65/EU.



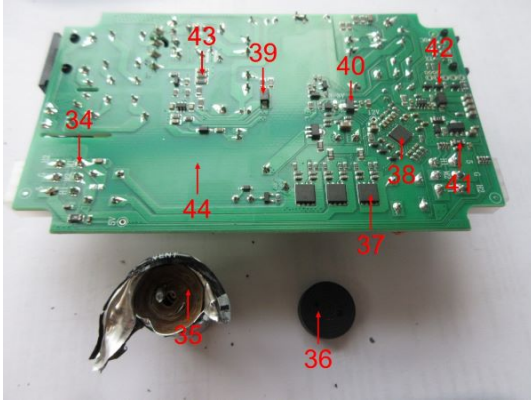
Sample Photos



**Test Report No.: 244591707a 001**

Page 10 of 10

Sample Photo



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