



Applicant: Zhejiang Shuangyang Group Co., Ltd.

Address: No.444, Sanbei West Road, Shiye Village, Guanhaiwei Town, Cixi City, Ningbo, Zhejiang Province, China

Attn: Mr. Cen

Sample Description: Mechanical plug-in time switch

Model No.: TS-MD31, TS-MD201, TS-MD203

Sample Received Date: 2025-05-20

Test Period: 2025-05-20 ~ 2025-06-06

Purpose of examination: Verification of RoHS (Restriction of Hazardous Substances) directive 2011/65/EU and its amendment (EU) 2015/863 on submitted samples

Test Results: Refer to following page(s)

Remark:

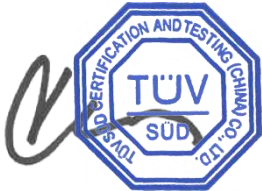
- The result relates only to the items tested.
- The reference model(s) was declared by client.
- The test sample(s) and item(s) was specified by client.

TEC_WUX_F_25.05E - Rev. 00 2021-06-24

TÜV SÜD Certification and Testing (China) Co., Ltd.

TÜV SÜD Group

Prepared by:



Yongfeng Du
Project Handler

Reviewed by:



Feng Zhang
Designated Reviewer

Disclaimer Measurement Uncertainty: Unless otherwise agreed upon, Pass or Fail verdicts are given base on the measured values without any considerations of measurement uncertainties. Please note, every test method has a measurement uncertainty which has been evaluated by the laboratory according to ISO/IEC 17025 requirements. By taking measurement uncertainties into account it might happen that measured values can neither be assessed as Pass nor as Fail.

Any use for advertising purposes must be granted in writing. This test report may only be quoted in full. This report is the result of a single examination of the object in question and is not generally applicable evaluation of the quality of other products in regular production. For further details, please see testing and certification regulation, chapter A-3.4.

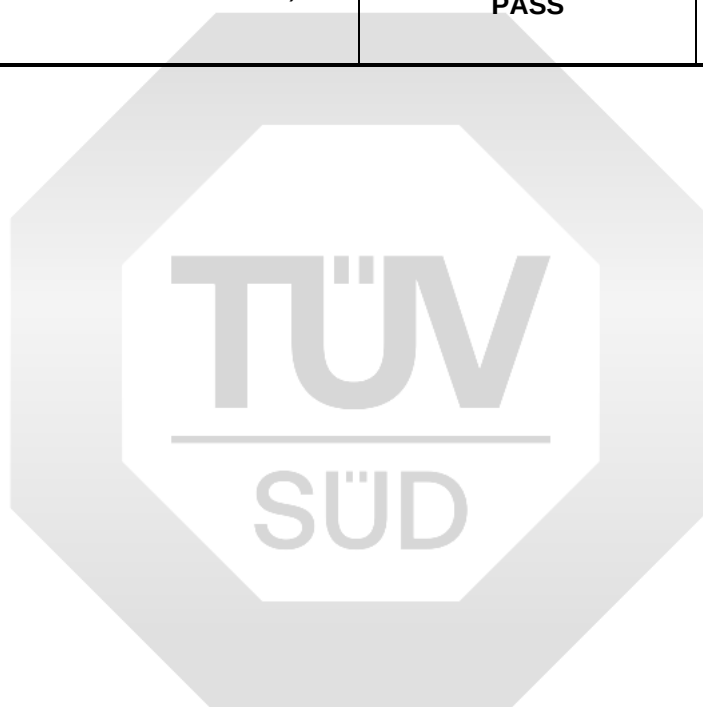
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Laboratory: TÜV SÜD Certification and Testing (China) Co.,
Ltd. Shanghai Branch Testing Center
No. 1999 Du Hui Rd, Minhang District, Shanghai 201108
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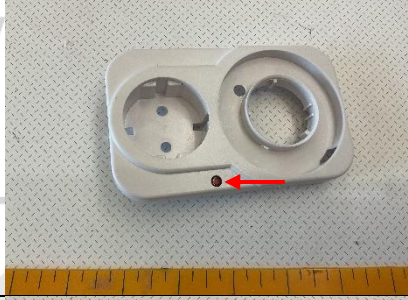


SUMMARY OF TEST RESULTS

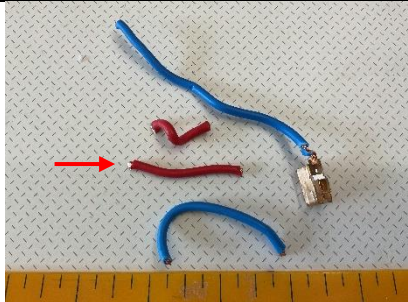
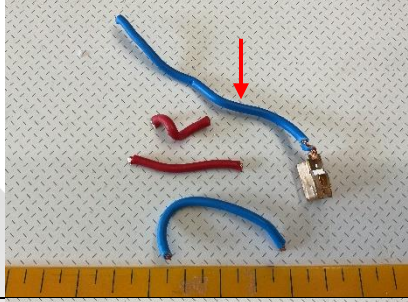
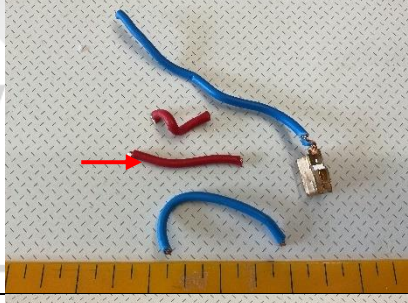
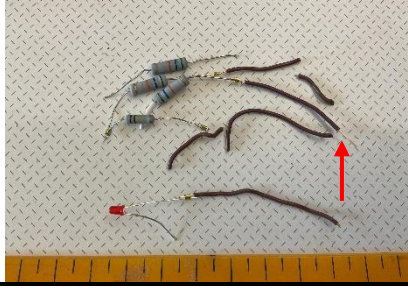
No.	Test Requested	Conclusion	Remarks
1.	Heavy Metal (Pb, Cd, Hg and Cr VI) Content	PASS	/
2.	Polybrominated Biphenyls (PBBs) and Polybrominated Diphenyl Ethers (PBDEs) Content	PASS	/
3.	Phthalates (DEHP, BBP, DBP and DIBP) Content	PASS	/

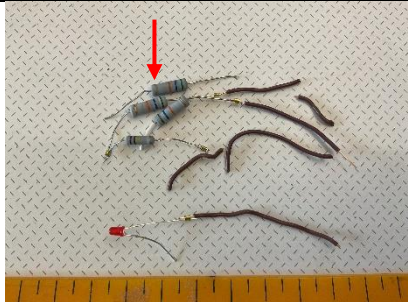
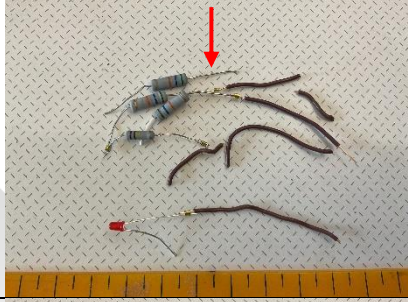


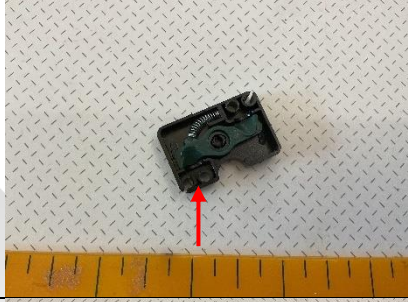
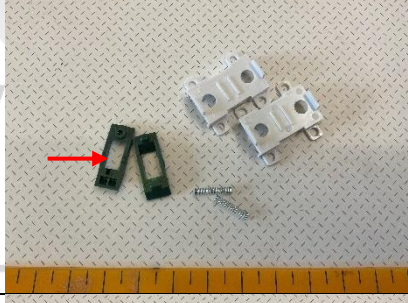
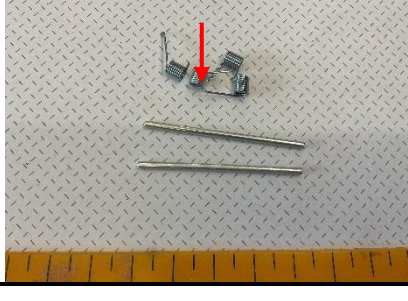
1. TESTED SUBJECT DESCRIPTION

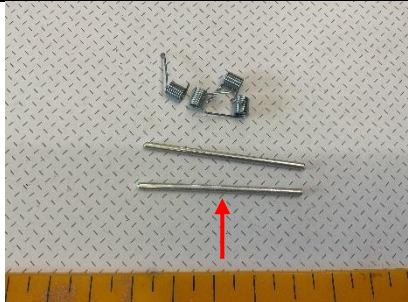
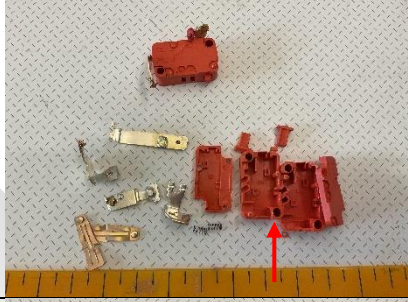
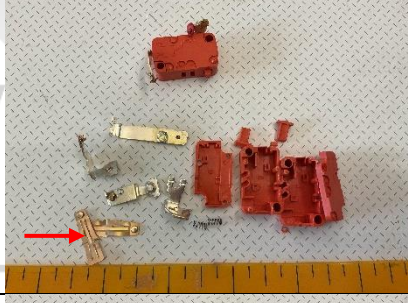
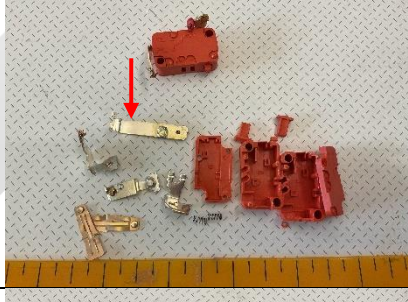
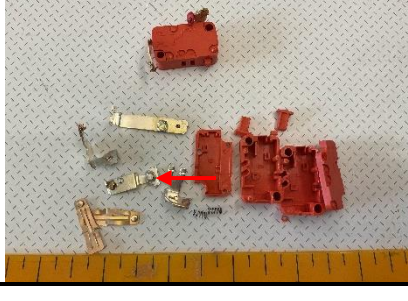
Sample Number	Tested Material Description	Photo
001	White sticker label	
002	White plastic component	
003	Red PC piece	
004	Transparent plastic component	
005	White plastic component	

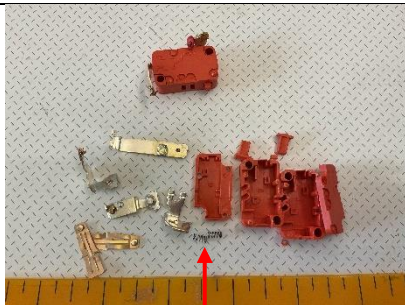
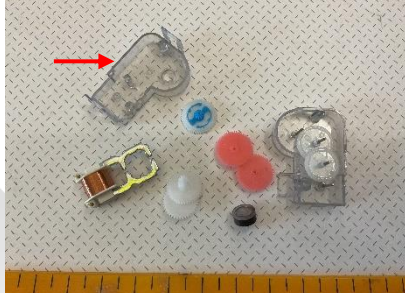
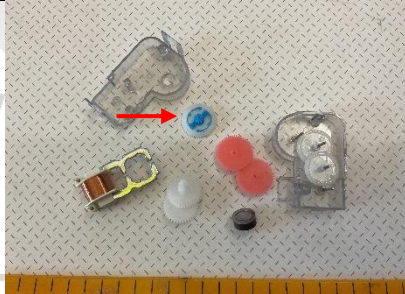
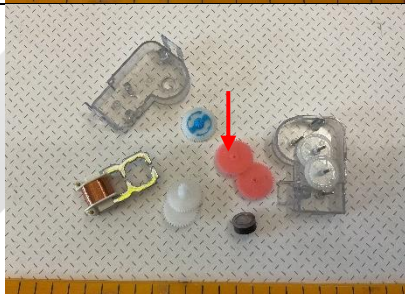
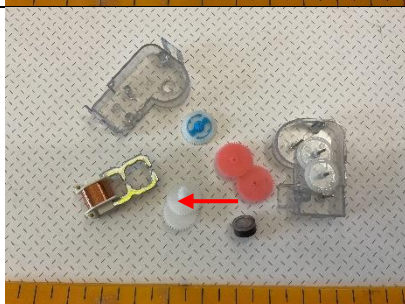
Sample Number	Tested Material Description	Photo
006	White soft polymer ring	
007	White plastic component	
008	White plastic component	
009	Black plastic component	
010	Orange plastic component	

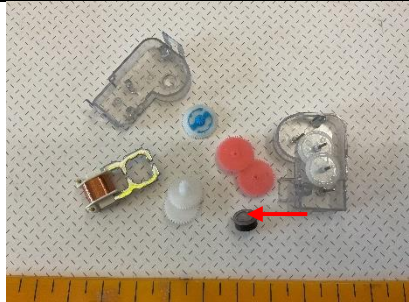
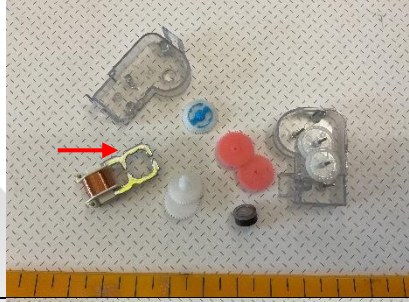
Sample Number	Tested Material Description	Photo
011	Inner copper cord	
012	Blue wire jacket	
013	Red wire jacket	
014	Brown wire jacket	
015	Silvery metal cord	

Sample Number	Tested Material Description	Photo
016	Grey resistor body	
017	Silvery grey metal pin	
018	Red LED body	
019	Silvery grey metal pin	
020	White polymer tube	

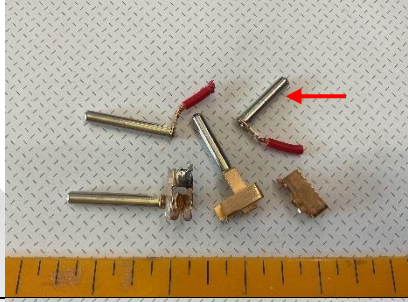
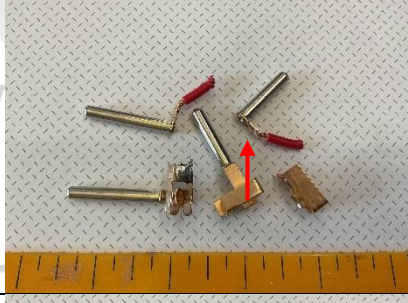
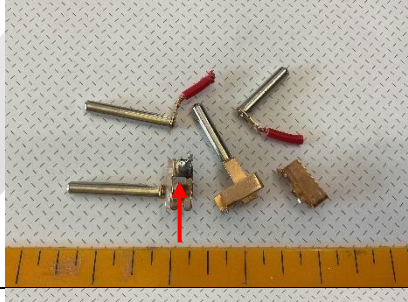
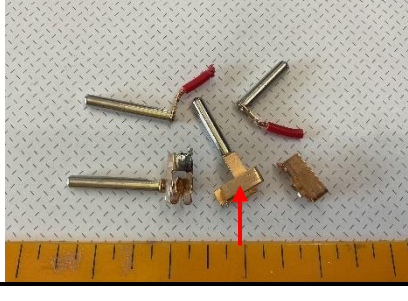
Sample Number	Tested Material Description	Photo
021	White plastic component	
022	Black plastic component	
023	Green plastic component	
024	Silvery grey metal spring	
025	Silvery grey metal spring	

Sample Number	Tested Material Description	Photo
026	Silvery grey metal pin	
027	Red switch body	
028	Copper piece	
029	Silvery grey metal shaft bar	
030	Inner metal terminal piece	

Sample Number	Tested Material Description	Photo
031	Grey metal spring	
032	Transparent plastic cover	
033	Bleu plastic component	
034	Pink red plastic component	
035	White plastic component	

Sample Number	Tested Material Description	Photo
036	Transparent plastic component	
037	Silvery grey metal component	
038	Coiled metal wire	
039	White plastic component	
040	Silvery grey metal component	

Sample Number	Tested Material Description	Photo
041	Pink plastic component	
042	Silvery grey metal pin	
043	Black magnetic piece	
044	White plastic component	
045	Silvery grey metal screws	

Sample Number	Tested Material Description	Photo
046	Silvery grey metal component	
047	Silvery grey metal pin	
048	Copper piece	
049	Silvery grey solder points	
050	Copper piece	

2. TEST RESULT(S)

2.1 SCREENING TEST

Test method: With reference to EN 62321-1:2013, BS EN IEC 62321-2:2021, EN 62321-3-1:2014 and EN 62321-8:2017. For Heavy Metals and Flame Retardants, analyzed by Energy Dispersive X-ray Fluorescence Spectrometer (XRF); for phthalates, analyzed by Gas Chromatography and Mass Spectrometer (GC-MS).

Sample No.	Heavy Metals and Flame Retardants					Phthalates			
	Cd	Pb	Hg	Cr	Br	DEHP	BBP	DBP	DIBP
001	BL	BL	BL	BL	BL	BL	BL	BL	BL
002	BL	BL	BL	BL	Inc. ^(a)	BL	BL	BL	BL
003	BL	BL	BL	BL	BL	BL	BL	BL	BL
004	BL	BL	BL	BL	BL	BL	BL	BL	BL
005	BL	BL	BL	BL	Inc. ^(a)	BL	BL	BL	BL
006	BL	BL	BL	BL	BL	BL	BL	BL	BL
007	BL	BL	BL	BL	Inc. ^(a)	BL	BL	BL	BL
008	BL	BL	BL	BL	BL	BL	BL	BL	BL
009	BL	BL	BL	BL	BL	BL	BL	BL	BL
010	BL	BL	BL	BL	BL	BL	BL	BL	BL
011	BL	BL	BL	BL	NA	NA	NA	NA	NA
012	BL	BL	BL	BL	BL	BL	BL	BL	BL
013	BL	BL	BL	BL	BL	BL	BL	BL	BL
014	BL	BL	BL	BL	BL	BL	BL	BL	BL
015	BL	BL	BL	BL	NA	NA	NA	NA	NA
016	BL	BL	BL	BL	BL	BL	BL	BL	BL
017	BL	BL	BL	BL	NA	NA	NA	NA	NA
018	BL	BL	BL	BL	BL	BL	BL	BL	BL
019	BL	BL	BL	BL	BL	BL	BL	BL	BL
020	BL	BL	BL	BL	BL	BL	BL	BL	BL
021	BL	BL	BL	BL	Inc. ^(a)	BL	BL	BL	BL
022	BL	BL	BL	BL	BL	BL	BL	BL	BL
023	BL	BL	BL	BL	BL	BL	BL	BL	BL
024	BL	BL	BL	Inc. ^(a)	NA	NA	NA	NA	NA
025	BL	BL	BL	BL	NA	NA	NA	NA	NA
026	BL	BL	BL	BL	NA	NA	NA	NA	NA
027	BL	BL	BL	BL	Inc. ^(a)	BL	BL	BL	BL
028	BL	BL	BL	BL	NA	NA	NA	NA	NA
029	BL	BL	BL	BL	NA	NA	NA	NA	NA

Sample No.	Heavy Metals and Flame Retardants					Phthalates			
	Cd	Pb	Hg	Cr	Br	DEHP	BBP	DBP	DIBP
030	BL	BL	BL	BL	NA	NA	NA	NA	NA
031	BL	BL	BL	BL	NA	NA	NA	NA	NA
032	BL	BL	BL	BL	BL	BL	BL	BL	BL
033	BL	BL	BL	BL	BL	BL	BL	BL	BL
034	BL	BL	BL	BL	BL	BL	BL	BL	BL
035	BL	BL	BL	BL	BL	BL	BL	BL	BL
036	BL	BL	BL	BL	BL	BL	BL	BL	BL
037	BL	BL	BL	Inc. ^(a)	NA	NA	NA	NA	NA
038	BL	BL	BL	BL	NA	NA	NA	NA	NA
039	BL	BL	BL	BL	BL	BL	BL	BL	BL
040	BL	BL	BL	BL	NA	NA	NA	NA	NA
041	BL	BL	BL	BL	BL	BL	BL	BL	BL
042	BL	BL	BL	Inc. ^(a)	NA	NA	NA	NA	NA
043	BL	BL	BL	BL	NA	NA	NA	NA	NA
044	BL	BL	BL	BL	BL	BL	BL	BL	BL
045	BL	BL	BL	BL	NA	NA	NA	NA	NA
046	BL	BL	BL	BL	NA	NA	NA	NA	NA
047	BL	BL	BL	BL	NA	NA	NA	NA	NA
048	BL	BL	BL	BL	NA	NA	NA	NA	NA
049	BL	BL	BL	BL	NA	NA	NA	NA	NA
050	BL	BL	BL	BL	NA	NA	NA	NA	NA

Note:

- "BL" denotes below limit
- "OL" denotes over limit
- "Inc." denotes inconclusive
- "NA" denotes not applicable
- ^(a) denotes further confirmation test was conducted, results are listed in 2.2, 2.3 and 2.4.

-XRF screening limits in mg/kg for regulated elements in various matrices

ELEMENT	POLYMER		
	BL	INCONCLUSIVE	OL
Cd	$X \leq (70-3\sigma)$	$(70-3\sigma) < X < (130+3\sigma)$	$X \geq (130+3\sigma)$
Pb	$X \leq (700-3\sigma)$	$(700-3\sigma) < X < (1300+3\sigma)$	$X \geq (1300+3\sigma)$
Hg	$X \leq (700-3\sigma)$	$(700-3\sigma) < X < (1300+3\sigma)$	$X \geq (1300+3\sigma)$
Br	$X \leq (300-3\sigma)$	$X > (300-3\sigma)$	NA
Cr	$X \leq (700-3\sigma)$	$X > (700-3\sigma)$	NA

ELEMENT	METAL		
	BL	INCONCLUSIVE	OL
Cd	$X \leq (70-3\sigma)$	$(70-3\sigma) < X < (130+3\sigma)$	$X \geq (130+3\sigma)$
Pb	$X \leq (700-3\sigma)$	$(700-3\sigma) < X < (1300+3\sigma)$	$X \geq (1300+3\sigma)$
Hg	$X \leq (700-3\sigma)$	$(700-3\sigma) < X < (1300+3\sigma)$	$X \geq (1300+3\sigma)$
Cr	$X \leq (700-3\sigma)$	$X > (700-3\sigma)$	NA

ELEMENT	COMPLEX MATERIAL		
	BL	INCONCLUSIVE	OL
Cd	$X \leq (50-3\sigma)$	$(50-3\sigma) < X < (150+3\sigma)$	$X \geq (150+3\sigma)$
Pb	$X \leq (500-3\sigma)$	$(500-3\sigma) < X < (1500+3\sigma)$	$X \geq (1500+3\sigma)$
Hg	$X \leq (500-3\sigma)$	$(500-3\sigma) < X < (1500+3\sigma)$	$X \geq (1500+3\sigma)$
Br	$X \leq (250-3\sigma)$	$X > (250-3\sigma)$	NA
Cr	$X \leq (500-3\sigma)$	$X > (500-3\sigma)$	NA

-Screening limits in mg/kg for regulated phthalates in various matrices

PHthalates	BL	INCONCLUSIVE
DEHP	$X < 600$	$X \geq 600$
BBP	$X < 600$	$X \geq 600$
DBP	$X < 600$	$X \geq 600$
DIBP	$X < 600$	$X \geq 600$

2.2 HEAVY METAL CONTENT

Test method: With reference to EN 62321-4:2014 /A1:2017, EN 62321-5:2014, EN 62321-7-1:2015 and EN 62321-7-2:2017, analyzed by Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES) and Ultraviolet-visible spectrophotometer (UV-Vis).

[Reporting Limit: 2.0 mg/kg for Cadmium; 5.0 mg/kg or 0.10 µg/cm² for Hexavalent Chromium, 10.0 mg/kg for Lead and Mercury.]

Sample No.	Result(s)				
	Total Cadmium	Hexavalent Chromium	Hexavalent Chromium	Total Mercury	Total Lead
024	--	/	Negative	--	--
037	--	/	Negative	--	--
042	--	/	Negative	--	--
Unit	mg/kg	mg/kg	µg/cm²	mg/kg	mg/kg
RoHS Requirement	<100	<1000	Negative [#]	<1000	<1000

Note:

- "mg/kg" denotes milligram per kilogram
- "µg/cm²" denotes micrograms per square centimeter
- "<" denotes less than
- "Positive" denotes the absorbance value of sample is > 0.13 µg/cm², the sample is considered to be positive for Hexavalent Chromium.
- "Inconclusive" denotes the absorbance value of sample is ≥ 0.10 µg/cm² and ≤ 0.13 µg/cm², the sample is considered to be Inconclusive for Hexavalent Chromium.
- "Negative" denotes the absorbance value of sample is < 0.10 µg/cm², the sample is considered to be negative for Hexavalent Chromium.
- "[#]" According to DIRECTIVE 2011/65/EU Article 4(1) and Annex II. While, positive means the presence of CrVI on tested areas and the result(s) was (were) regarded as in conflict with European Parliament and Council Directive 2011/65/EU, Article 4(1) and Annex II.
- "--" denotes tested by XRF, result is listed in 2.1.



2.3 POLYBROMINATED BIPHENYLS (PBBs) AND POLYBROMINATED DIPHENYL ETHERS (PBDEs)

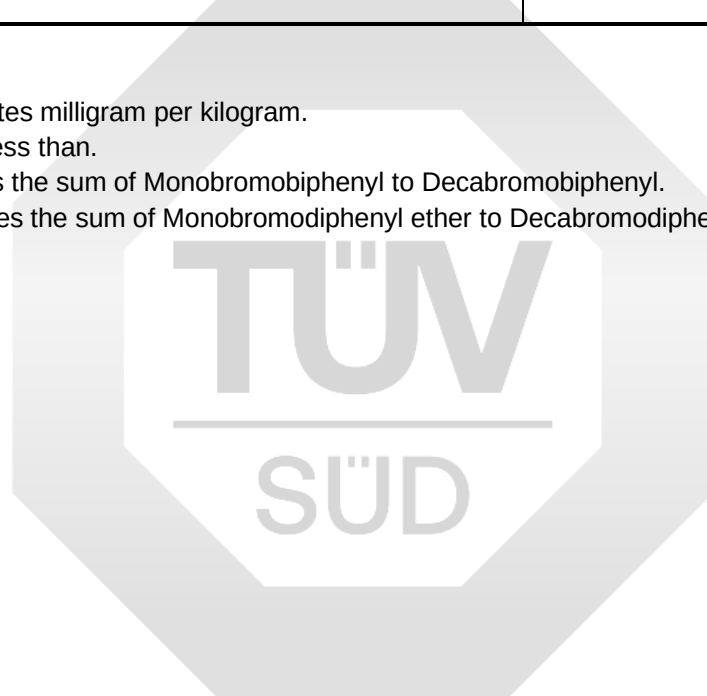
CONTENT

Test Method: With reference to EN 62321-6:2015, extracted by toluene and analyzed by Gas Chromatography and Mass Spectrometer (GC-MS). [Reporting Limit : 5 mg/kg]

Sample No.	Result(s)	
	Polybrominated Biphenyls (PBBs)	Polybrominated Diphenyl Ethers (PBDEs)
002+005+007	<50	<50
021+027	<50	<50
Unit	mg/kg	mg/kg
RoHS Requirement	<1000	<1000

Note:

- "mg/kg" denotes milligram per kilogram.
- "<" denotes less than.
- PBBs denotes the sum of Monobromobiphenyl to Decabromobiphenyl.
- PBDEs denotes the sum of Monobromodiphenyl ether to Decabromodiphenyl ether.



APPENDIX I:

Photos of submitted products



Sample Description: Mechanical plug-in time switch
Model No.: TS-MD31, TS-MD201, TS-MD203

Additional Listed Models Reference

Model No.:

TS-MD1/2/3/4/4-D/9/20/21/22/24/35/202/203,
TS-WD1/2/3/4/4-D,
TS-MF1/3/4/20/201/202,
TS-WF1/3/4/201/202,
TS-ME1/4/20/35/201,
TS-WE1/20,
TS-MI2/2(10)/20/201/202,
TS-WI2/2(10)/4/20/201/202,
TS-MN2/4/6/201/202/N2/N4/N201,
TS-WN2/4/201/202/N2/N4, TS-GM1, TS-MS2/WS2

Remarks:

The above listed may covered models were only based on client's guarantee letter (self-declaration). TÜV SÜD takes no responsibility for any mistakes and the problems of product consistency caused by inaccurate and/or invalid information submitted by the client.

-----End of Report-----