

Report No. 48.400.22.1450.01-00/02

Dated 2023-01-11



## SVHC Assessment Report

**Applicant:** Anhui Huasun Energy Co.,Ltd.  
No. 99, Qingliu Road, Xuancheng Economic and Technological Development Zone, Xuanzhou District, 242000 Xuancheng City, Anhui Province, PEOPLE'S REPUBLIC OF CHINA

**Contact person:** Lv Qiang

**Test object:** The submitted samples were received and described by client as:  
**Product: 166 PV Modules, 210 PV Modules**  
**Product picture refer to the APPENDIX I.**

**Purpose of Evaluation:** Based on the Candidate List, to test the listed 224 substances of Substances of Very High Concern (SVHC) for Authorisation updated on 10th June, 2022, which was published in accordance with Article 59(10) of the REACH Regulation (EC) No 1907/2006.

**Test method:** 1). Test portion is digested with acid, analyzed by ICP-OES and UV-VIS.  
2). Organic solvent extraction, analyzed by GC-MS, HPLC.

<b>Summary:</b>	The substances of Very High Concern concentration <b>less than</b> 0.1%	Group 3~4
	The substances of Very High Concern concentration <b>more than</b> 0.1%	Group 1~2 (page 9~10)

**Remark:**

1. The tested samples were identified and appointed by client.
2. The result relates only to the items tested.
3. As the client required, the sample was tested in mixture.

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## 1. Order

### 1.1 Date of Purchase Order

2022-12-29

### 1.2 Customer's Reference

Nil

### 1.3 Receipt Date of Test Sample

2022-12-17

### 1.4 Date of Testing

2022-12-28 – 2023-01-11

### 1.5 Location of Testing

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Shanghai Branch, SHA Chemical Lab.



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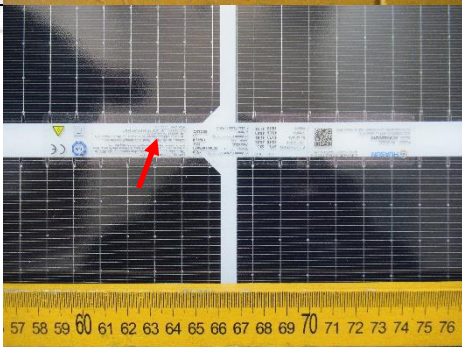
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## 2. Description of the Evaluated Product

Sample No	Description	Photograph
01	Silvery metal frame	
02	Blue photovoltaic panel	
03	Silvery aluminium alloy bracket	
04	Transparent plastic label with ink	

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Sample No	Description	Photograph
05	White label	
06	Golden metal foil	
07	White glue	
08	White plastic cable tie	

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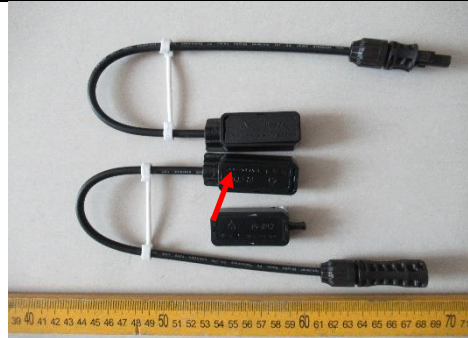
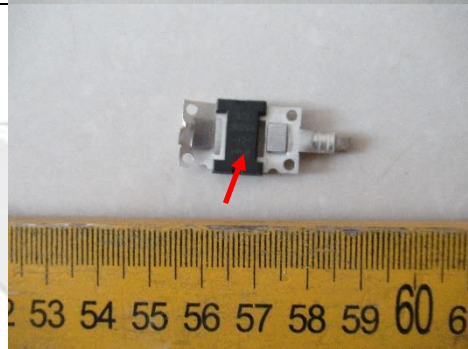
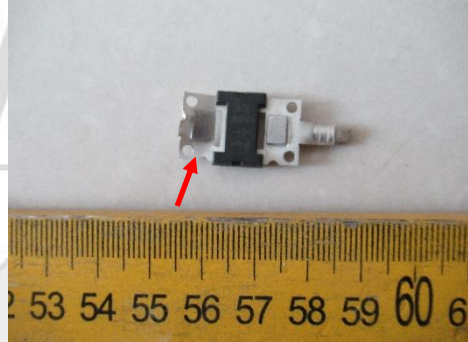
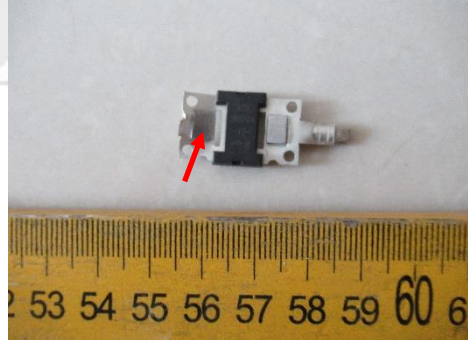
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Sample No	Description	Photograph
09	Black plastic shell	
10	Black IC	
11	Silvery metal contact piece	
12	Silvery solder	

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Sample No	Description	Photograph
13	Black plastic plug enclosure	
14	Black plastic sealing ring	
15	Red plastic sleeve	
16	Black plastic cable sleeve	

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Sample No	Description	Photograph
17	Silvery metal sleeve	
18	Silvery metal contact pin	
19	Black plastic insulation	
20	Black plastic cable jacket	

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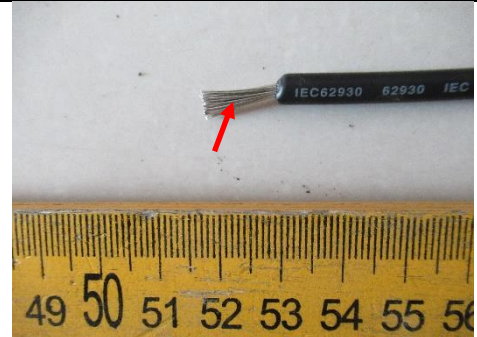
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Sample No	Description	Photograph
21	Silvery copper alloy wire	

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3. Test Data:

Group NO	Sample ID
Group 1	01+03+06+11+12+17+18+21
Group 2	02
Group 3	04+05+07+13+14+15+16+19
Group 4	08+09+10+20

Group NO	Concentration of each SVHC in the submitted Objects (%)	Conclusion
Group 3	<0.01%	PASS
Group 4	<0.01%	PASS

Group NO / Sample NO	Result (%)		Conclusion
	Lead (CAS No.: 7439-92-1)	Other substances of very high concern (SVHCs)	
Group 1 (Sample 01+03+06+11+12+17+18+21)	2.45%	<0.01%	--
Sample 01	<0.01%	<0.01%	PASS
Sample 03	<0.01%	<0.01%	PASS
Sample 06	3.37%	<0.01%	--
Sample 11	2.17%	<0.01%	--
Sample 12	19.82%	<0.01%	--
Sample 17	<0.01%	<0.01%	PASS
Sample 18	<0.01%	<0.01%	PASS
Sample 21	<0.01%	<0.01%	PASS

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Test Item(s)	CAS No.	Result(s) (%)	Conclusion
		Group 2 (Sample 02)	
Lead diazide, Lead azide**	13424-46-9	0.26%	--
Lead dipicrate**	6477-64-1	0.60%	
Lead styphnate**	15245-44-0	0.41%	
Lead(II) bis(methanesulfonate) **	17570-76-2	0.36%	
Acetic acid, lead salt, basic**	51404-69-4	0.26%	
Trilead bis(carbonate)dihydroxide**	1319-46-6	0.23%	
Lead oxide sulfate**	12036-76-9	0.24%	
[Phthalato(2-)]dioxotrilead**	69011-06-9	0.25%	
Dioxobis(stearato)trilead**	12578-12-0	0.40%	
Fatty acids, C16-18, lead salts**	91031-62-8	0.68%	
Lead cyanamidate**	20837-86-9	0.23%	
Lead dinitrate**	10099-74-8	0.30%	
Lead monoxide (lead oxide) **	1317-36-8	0.22%	
Orange lead (lead tetroxide) **	1314-41-6	0.21%	
Pentalead tetraoxide sulphate**	12065-90-6	0.24%	
Silicic acid, lead salt**	11120-22-2	0.03%	
Sulfurous acid, lead salt, dibasic**	62229-08-7	0.26%	
Tetraethyllead**	78-00-2	0.29%	
Tetralead trioxide sulphate**	12202-17-4	0.22%	
Trilead dioxide phosphonate**	12141-20-7	0.22%	
Lead di(acetate) **	301-04-2	0.30%	
Lead	7439-92-1	0.19%	
Others substances of very high concern (SVHC)		<0.01%	

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**Remark:**

1. Detection limit = 0.01%
2. "<" denoted less than.
3. "\*\*\*" The substances are tested in terms of its respective elements and the test result is based on the calculation of selected elements.



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#### 4. SVHC candidate list published by European Chemical Agency (ECHA)

SN	Test Item(s)	CAS No.	Classification
1	Lead hydrogen arsenate	7784-40-9	Carcinogenic and toxic for reproduction (articles 57 a and 57 c)
2	Benzyl butyl phthalate (BBP)	85-68-7	Toxic for reproduction (article 57c)
3	Bis (2-ethylhexyl)phthalate (DEHP)	117-81-7	Toxic for reproduction (article 57c)
4	5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)	81-15-2	vPvB (article 57e)
5	Diarsenic trioxide	1327-53-3	Carcinogenic (article 57a)
6	Bis(tributyltin)oxide (TBTO)	56-35-9	PBT (article 57d)
7	Triethyl arsenate	15606-95-8	Carcinogenic (article 57a)
8	Diarsenic pentaoxide	1303-28-2	Carcinogenic (article 57a)
9	Sodium dichromate	7789-12-0, 10588-01-9	Carcinogenic, mutagenic and toxic for reproduction (articles 57a, 57b and 57c)
10	Dibutyl phthalate (DBP)	84-74-2	Toxic for reproduction (article 57c)
11	4,4'- Diaminodiphenylmethane (MDA)	101-77-9	Carcinogenic (article 57a)
12	Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)	85535-84-8	PBT and vPvB (articles 57 d and 57 e)
13	Anthracene	120-12-7	PBT (article 57d)
14	Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified: Alpha-hexabromocyclododecane Beta-hexabromocyclododecane Gamma-hexabromocyclododecane	25637-99-4, 3194-55-6 (134237-50-6) (134237-51-7) (134237-52-8)	PBT (article 57d)
15	Lead sulfochromate yellow (C.I. Pigment Yellow 34)	1344-37-2	Carcinogenic and toxic for reproduction (articles 57 a and 57 c))
16	Lead chromate molybdate sulphate red (C.I. Pigment Red 104)	12656-85-8	Carcinogenic and toxic for reproduction (articles 57 a and 57 c)
17	Anthracene oil	90640-80-5	Carcinogenic <sup>1</sup> , PBT and vPvB (articles 57a, 57d and 57e)
18	2,4-Dinitrotoluene	121-14-2	Carcinogenic (article 57a)
19	Anthracene oil, anthracene paste, anthracene fraction	91995-15-2	Carcinogenic <sup>2</sup> , mutagenic <sup>3</sup> , PBT and vPvB (articles 57a, 57b, 57d and 57e)
20	Anthracene oil, anthracene-low	90640-82-7	Carcinogenic <sup>2</sup> , mutagenic <sup>3</sup> , PBT and vPvB (articles 57a, 57b, 57d and 57e)

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21	Tris(2-chloroethyl)phosphate	115-96-8	Toxic for reproduction (article 57c)
22	Diisobutyl phthalate	84-69-5	Toxic for reproduction (article 57c)
23	Lead chromate	7758-97-6	Carcinogenic and toxic for reproduction (articles 57 a and 57 c)
24	Anthracene oil, anthracene paste	90640-81-6	Carcinogenic <sup>2</sup> , mutagenic <sup>3</sup> , PBT and vPvB (articles 57a, 57b, 57d and 57e)
25	Pitch, coal tar, high temp.	65996-93-2	Carcinogenic, PBT and vPvB (articles 57a, 57d and 57e)
26	Anthracene oil, anthracene paste, distn. lights	91995-17-4	Carcinogenic <sup>2</sup> , mutagenic <sup>3</sup> , PBT and vPvB (articles 57a, 57b, 57d and 57e)
27	Acrylamide	79-06-1	Carcinogenic and mutagenic (articles 57 a and 57 b)
28	Trichloroethylene	79-01-6	Carcinogenic (article 57 a)
29	Potassium dichromate	7778-50-9	Carcinogenic, mutagenic and toxic for reproduction (articles 57 a, 57 b and 57 c)
30	Tetraboron disodium heptaoxide, hydrate	12267-73-1	Toxic for reproduction (article 57 c)
31	Ammonium dichromate	7789-09-5	Carcinogenic, mutagenic and toxic for reproduction (articles 57 a, 57 b and 57 c)
32	Boric acid	10043-35-3, 11113-50-1	Toxic for reproduction (article 57 c)
33	Sodium chromate	7775-11-3	Carcinogenic, mutagenic and toxic for reproduction (articles 57 a, 57 b and 57 c)
34	Disodium tetraborate, anhydrous	1303-96-4, 1330-43-4, 12179-04-3	Toxic for reproduction (article 57 c)
35	Potassium chromate	7789-00-6	Carcinogenic and mutagenic (articles 57 a and 57 b).
36	Cobalt(II) diacetate	71-48-7	Carcinogenic and toxic for reproduction (articles 57 a and 57 c)
37	Cobalt(II) sulphate	10124-43-3	Carcinogenic and toxic for reproduction (articles 57 a and 57 c)
38	2-Ethoxyethanol	110-80-5	Toxic for reproduction (article 57c)
39	Acids generated from chromium trioxide and their oligomers. Names of the acids and their oligomers: Chromic acid, Dichromic acid, Oligomers of chromic acid and dichromic acid.	7738-94-5, 13530-68-2	Carcinogenic (article 57a)
40	2-Methoxyethanol	109-86-4	Toxic for reproduction (article 57c)
41	Chromium trioxide	1333-82-0	Carcinogenic and mutagenic (articles 57 a and 57 b)

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SN	Test Item(s)	CAS No.	Classification
42	Cobalt(II) carbonate	513-79-1	Carcinogenic and toxic for reproduction (articles 57 a and 57 c)
43	Cobalt(II) dinitrate	10141-05-6	Carcinogenic and toxic for reproduction (articles 57 a and 57 c)
44	1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich	71888-89-6	Toxic for reproduction (article 57c)
45	1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters	68515-42-4	Toxic for reproduction (article 57c)
46	Strontium chromate	7789-06-2	Carcinogenic (article 57a)
47	1-Methyl-2-pyrrolidone	872-50-4	Toxic for reproduction (article 57c)
48	1,2,3-Trichloropropane	96-18-4	Carcinogenic and toxic for reproduction (articles 57 a and 57 c)
49	2-Ethoxyethyl acetate	111-15-9	Toxic for reproduction (article 57c)
50	Hydrazine	302-01-2, 7803-57-8	Carcinogenic (article 57a)
51	Cobalt dichloride	7646-79-9	Carcinogenic and toxic for reproduction (articles 57 a and 57 c)
52	4-(1,1,3,3-tetramethylbutyl)phenol	140-66-9	Equivalent level of concern having probable serious effects to the environment (article 57 f)
53	N,N-dimethylacetamide	127-19-5	Toxic for reproduction (article 57 c)
54	Phenolphthalein	77-09-8	Carcinogenic (article 57 a)
55	Lead diazide, Lead azide	13424-46-9	Toxic for reproduction (article 57 c),
56	Lead dipicrate	6477-64-1	Toxic for reproduction (article 57 c)
57	1,2-dichloroethane	107-06-2	Carcinogenic (article 57 a)
58	Calcium arsenate	7778-44-1	Carcinogenic (article 57 a)
59	Dichromium tris(chromate)	24613-89-6	Carcinogenic (article 57 a)
60	2-Methoxyaniline; o-Anisidine	90-04-0	Carcinogenic (article 57 a)
61	Pentazinc chromate octahydroxide	49663-84-5	Carcinogenic (article 57 a)
62	Arsenic acid	7778-39-4	Carcinogenic (article 57 a)
63	Potassium hydroxyoctaoxidizincatedichromate	11103-86-9	Carcinogenic (article 57 a)
64	Formaldehyde, oligomeric reaction products with aniline	25214-70-4	Carcinogenic (article 57 a)

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65	Lead styphnate	15245-44-0	Toxic for reproduction (article 57 c)
66	Trilead diarsenate	3687-31-8	Carcinogenic and toxic for reproduction (articles 57 a and 57 c)
67	Zirconia Aluminosilicate Refractory Ceramic Fibres <i>are fibres covered by index number 650-017-00-8 in Annex VI, part 3, table 3.1 of Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, and fulfil the three following conditions: a) oxides of aluminium, silicon and zirconium are the main components present (in the fibres) within variable concentration ranges b) fibres have a length weighted geometric mean diameter less two standard geometric errors of 6 or less micrometres (µm). c) alkaline oxide and alkali earth oxide (Na<sub>2</sub>O+K<sub>2</sub>O+CaO+MgO+BaO) content less or equal to 18% by weight</i>	-	Carcinogenic (article 57 a)
68	Bis(2-methoxyethyl) phthalate	117-82-8	Toxic for reproduction (article 57 c)
69	Aluminosilicate Refractory Ceramic Fibres <i>are fibres covered by index number 650-017-00-8 in Annex VI, part 3, table 3.1 of Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, and fulfil the three following conditions: a) oxides of aluminium and silicon are the main components present (in the fibres) within variable concentration ranges b) fibres have a length weighted geometric mean diameter less two standard geometric errors of 6 or less micrometres (µm) c) alkaline oxide and alkali earth oxide (Na<sub>2</sub>O+K<sub>2</sub>O+CaO+MgO+BaO) content less or equal to 18% by weight</i>	-	Carcinogenic (article 57 a)
70	Bis(2-methoxyethyl) ether	111-96-6	Toxic for reproduction (article 57 c)
71	2,2'-dichloro-4,4'-methylenedianiline	101-14-4	Carcinogenic (article 57 a)
72	α,α-Bis[4-(dimethylamino)phenyl]-4(phenylamino)naphthalene-1-methanol (C.I. Solvent Blue 4) [with ≥ 0.1% of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)]	6786-83-0	Carcinogenic (Article 57a)
73	N,N,N',N'-tetramethyl-4,4'-methylenedianiline (Michler's base)	101-61-1	Carcinogenic (Article 57a)

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SN	Test Item(s)	CAS No.	Classification
74	1,3,5-tris[(2S and 2R)-2,3-epoxypropyl]-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione (β-TGIC)	59653-74-6	Mutagenic (Article 57b)
75	Diboron trioxide	1303-86-2	Toxic for reproduction (Article 57c)
76	1,2-bis(2-methoxyethoxy)ethane (TEGDME; triglyme)	112-49-2	Toxic for reproduction (Article 57c)
77	4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol [with ≥ 0.1% of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)]	561-41-1	Carcinogenic (Article 57a)
78	Lead(II) bis(methanesulfonate)	17570-76-2	Toxic for reproduction (Article 57c)
79	Formamide	75-12-7	Toxic for reproduction (Article 57c)
80	[4-[4,4'-bis(dimethylamino)benzhydrylidene]cyclohexa-2,5-dien-1-ylidene]dimethylammonium chloride (C.I. Basic Violet 3) [with ≥ 0.1% of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)]	548-62-9	Carcinogenic (Article 57a)
81	1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME)	110-71-4	Toxic for reproduction (Article 57c)
82	[4-[[4-anilino-1-naphthyl][4-(dimethylamino)phenyl]methylene]cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Blue 26) [with ≥ 0.1% of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)]	2580-56-5	Carcinogenic (Article 57a)
83	1,3,5-Tris(oxiran-2-ylmethyl)-1,3,5-triazinane-2,4,6-trione (TGIC)	2451-62-9	Mutagenic (Article 57b)
84	4,4'-bis(dimethylamino)benzophenone (Michler's ketone)	90-94-8	Carcinogenic (Article 57a)
85	Pyrochlore, antimony lead yellow	8012-00-8	Toxic for reproduction (Article 57c)
86	6-methoxy-m-toluidine (p-cresidine)	120-71-8	Carcinogenic (Article 57a)
87	Henicosfluoroundecanoic acid	2058-94-8	vPvB (Article 57 e)
88	Hexahydromethylphthalic anhydride [1], Hexahydro-4-methylphthalic anhydride [2], Hexahydro-1-methylphthalic anhydride [3], Hexahydro-3-methylphthalic anhydride [4] [The individual isomers [2], [3] and [4] (including their cis- and trans- stereo isomeric forms) and all possible combinations of the isomers [1] are covered by this entry]	25550-51-0, 19438-60-9, 48122-14-1, 57110-29-9	Equivalent level of concern having probable serious effects to human health (Article 57 f)
89	Cyclohexane-1,2-dicarboxylic anhydride [1], cis-cyclohexane-1,2-dicarboxylic anhydride [2], trans-cyclohexane-1,2-dicarboxylic anhydride [3] [The individual cis- [2] and trans- [3] isomer substances	85-42-7, 13149-00-3, 14166-21-3	Equivalent level of concern having probable serious effects to human health (Article 57 f)

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SN	Test Item(s)	CAS No.	Classification
	and all possible combinations of the cis- and trans-isomers [1] are covered by this entry]		
90	Dibutyltin dichloride (DBTC)	683-18-1	Toxic for reproduction (Article 57 c)
91	Lead bis(tetrafluoroborate)	13814-96-5	Toxic for reproduction (Article 57 c)
92	Lead dinitrate	10099-74-8	Toxic for reproduction (Article 57 c)
93	Silicic acid, lead salt	11120-22-2	Toxic for reproduction (Article 57 c)
94	4-Aminoazobenzene	60-09-3	Carcinogenic (Article 57a)
95	Lead titanium zirconium oxide	12626-81-2	Toxic for reproduction (Article 57 c)
96	Lead monoxide (lead oxide)	1317-36-8	Toxic for reproduction (Article 57 c)
97	o-Toluidine	95-53-4	Carcinogenic (Article 57a)
98	3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine	143860-04-2	Toxic for reproduction (Article 57 c)
99	Silicic acid (H <sub>2</sub> Si <sub>2</sub> O <sub>5</sub> ), barium salt (1:1), lead-doped [with lead (Pb) content above the applicable generic concentration limit for 'toxicity for reproduction' Repr. 1A (CLP) or category 1 (DSD); the substance is a member of the group entry of lead compounds, with index number 082-001-00-6 in Regulation (EC) No 1272/2008]	68784-75-8	Toxic for reproduction (Article 57 c)
100	Trilead bis(carbonate)dihydroxide	1319-46-6	Toxic for reproduction (Article 57 c)
101	Furan	110-00-9	Carcinogenic (Article 57a)
102	N,N-dimethylformamide	68-12-2	Toxic for reproduction (Article 57 c)
103	4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated [covering well-defined substances and UVCB substances, polymers and homologues]	-	Equivalent level of concern having probable serious effects to the environment (Article 57 f)
104	4-Nonylphenol, branched and linear [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof]	-	Equivalent level of concern having probable serious effects to the environment (Article 57 f)
105	4,4'-methylenedi-o-toluidine	838-88-0	Carcinogenic (Article 57a)
106	Diethyl sulphate	64-67-5	Carcinogenic (Article 57a); Mutagenic (Article 57b)

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SN	Test Item(s)	CAS No.	Classification
107	Dimethyl sulphate	77-78-1	Carcinogenic (Article 57a)
108	Lead oxide sulfate	12036-76-9	Toxic for reproduction (Article 57 c)
109	Lead titanium trioxide	12060-00-3	Toxic for reproduction (Article 57 c)
110	Acetic acid, lead salt, basic	51404-69-4	Toxic for reproduction (Article 57 c)
111	[Phthalato(2-)]dioxotrilead	69011-06-9	Toxic for reproduction (Article 57 c)
112	Bis(pentabromophenyl) ether (decabromodiphenyl ether; DecaBDE)	1163-19-5	PBT (Article 57 d); vPvB (Article 57 e)
113	N-methylacetamide	79-16-3	Toxic for reproduction (Article 57 c)
114	Dinoseb (6-sec-butyl-2,4-dinitrophenol)	88-85-7	Toxic for reproduction (Article 57 c)
115	1,2-Diethoxyethane	629-14-1	Toxic for reproduction (Article 57 c)
116	Tetralead trioxide sulphate	12202-17-4	Toxic for reproduction (Article 57 c)
117	N-pentyl-isopentylphthalate	776297-69-9	Toxic for reproduction (Article 57 c)
118	Dioxobis(stearato)trilead	12578-12-0	Toxic for reproduction (Article 57 c)
119	Tetraethyllead	78-00-2	Toxic for reproduction (Article 57 c)
120	Pentalead tetraoxide sulphate	12065-90-6	Toxic for reproduction (Article 57 c)
121	Pentacosafuorotridecanoic acid	72629-94-8	vPvB (Article 57 e)
122	Tricosafuorododecanoic acid	307-55-1	vPvB (Article 57 e)
123	Heptacosafuorotetradecanoic acid	376-06-7	vPvB (Article 57 e)
124	1-bromopropane (n-propyl bromide)	106-94-5	Toxic for reproduction (Article 57 c)
125	Methoxyacetic acid	625-45-6	Toxic for reproduction (Article 57 c)
126	4-methyl-m-phenylenediamine (toluene-2,4-diamine)	95-80-7	Carcinogenic (Article 57a)
127	Methyloxirane (Propylene oxide)	75-56-9	Carcinogenic (Article 57a); Mutagenic (Article 57b)
128	Trilead dioxide phosphonate	12141-20-7	Toxic for reproduction (Article 57 c)
129	o-aminoazotoluene	97-56-3	Carcinogenic (Article 57a)
130	1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	84777-06-0	Toxic for reproduction (Article 57 c)
131	4,4'-oxydianiline and its salts	101-80-4	Carcinogenic (Article 57a); Mutagenic (Article 57b)

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SN	Test Item(s)	CAS No.	Classification
132	Orange lead (lead tetroxide)	1314-41-6	Toxic for reproduction (Article 57 c)
133	Biphenyl-4-ylamine	92-67-1	Carcinogenic (Article 57a)
134	Diisopentylphthalate	605-50-5	Toxic for reproduction (Article 57 c)
135	Fatty acids, C16-18, lead salts	91031-62-8	Toxic for reproduction (Article 57 c)
136	Diazene-1,2-dicarboxamide (C,C'-azodi(formamide))	123-77-3	Equivalent level of concern having probable serious effects to human health (Article 57 f)
137	Sulfurous acid, lead salt, dibasic	62229-08-7	Toxic for reproduction (Article 57 c)
138	Lead cyanamidate	20837-86-9	Toxic for reproduction (Article 57 c)
139	Cadmium	7440-43-9	Carcinogenic (Article 57a); Equivalent level of concern having probable serious effects to human health (Article 57 f)
140	Ammonium pentadecafluorooctanoate (APFO)	3825-26-1	Toxic for reproduction (Article 57 c); PBT (Article 57 d)
141	Pentadecafluorooctanoic acid (PFOA)	335-67-1	Toxic for reproduction (Article 57 c); PBT (Article 57 d)
142	Dipentyl phthalate (DPP)	131-18-0	Toxic for reproduction (Article 57 c)
143	4-Nonylphenol, branched and linear, ethoxylated [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, ethoxylated covering UVCB- and well-defined substances, polymers and homologues, which include any of the individual isomers and/or combinations thereof]	-	Equivalent level of concern having probable serious effects to the environment (Article 57 f)
144	Cadmium oxide	1306-19-0	Carcinogenic (Article 57a); Equivalent level of concern having probable serious effects to human health (Article 57 f)
145	Cadmium sulphide	1306-23-6	Carcinogenic (Article 57a); Equivalent level of concern having probable serious effects to human health (Article 57 f)
146	Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate) (C.I. Direct Red 28)	573-58-0	Carcinogenic (Article 57a)
147	Disodium 4-amino-3-[[4'-[(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo]-5-hydroxy-6-(phenylazo)naphthalene-2,7-	1937-37-7	Carcinogenic (Article 57a)

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SN	Test Item(s)	CAS No.	Classification
	disulphonate (C.I. Direct Black 38)		
148	Dihexyl phthalate	84-75-3	Toxic for reproduction (Article 57 c)
149	Imidazolidine-2-thione (2-imidazoline-2-thiol)	96-45-7	Toxic for reproduction (Article 57 c)
150	Lead di(acetate)	301-04-2	Toxic for reproduction (Article 57 c)
151	Trixylyl phosphate	25155-23-1	Toxic for reproduction (Article 57 c)
152	1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	68515-50-4	Toxic for reproduction (Article 57 c)
153	Cadmium chloride	10108-64-2	Carcinogenic (Article 57a); Mutagenic (Article 57(b)); Toxic for Reproduction (Article 57(c)); Equivalent level of concern having probable serious effects to human health (Article 57 f)
154	Sodium perborate; perboric acid, sodium salt	--	Toxic for reproduction (Article 57 c)
155	Sodium peroxometaborate	7632-04-4	Toxic for reproduction (Article 57 c)
156	2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)	3846-71-7	PBT (Article 57 d); vPvB (Article 57 e)
157	2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)	15571-58-1	Toxic for reproduction (Article 57 c)
158	reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE)	--	Toxic for reproduction (Article 57 c)
159	2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	25973-55-1	PBT (Article 57 d); vPvB (Article 57 e)
160	Cadmium fluoride	7790-79-6	Carcinogenic (Article 57 a); Mutagenic (Article 57 b); Toxic for reproduction (Article 57 c); Equivalent level of concern having probable serious effects to human health (Article 57 f)

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SN	Test Item(s)	CAS No.	Classification
161	Cadmium sulphate	10124-36-4 31119-53-6	Carcinogenic (Article 57 a); Mutagenic (Article 57 b); Toxic for reproduction (Article 57 c); Equivalent level of concern having probable serious effects to human health (Article 57 f)
162	1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with $\geq 0.3\%$ of dihexyl phthalate	68515-51-5 68648-93-1	Toxic for Reproduction (Article 57 c)
163	5-sec-butyl-2-(2,4-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [1], 5-sec-butyl-2-(4,6-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [2]	117933-89-8	vPvB (Article 57 e)
164	1,3-propanesultone	1120-71-4	Carcinogenic (Article 57 a)
165	2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327)	3864-99-1	vPvB (Article 57 e)
166	2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-350)	36437-37-3	vPvB (Article 57 e)
167	Nitrobenzene	98-95-3	Toxic for reproduction (Article 57 c)
168	Perfluorononan-1-oic acid (2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,9-heptafluorononanoic acid and its sodium and ammonium salts	375-95-1; 21049-39-8; 4149-60-4	Toxic for reproduction (Article 57 c); PBT (Article 57 d)
169	Benzo[def]chrysene (Benzo[a]pyrene)	50-32-8	Carcinogenic (Article 57 a); Mutagenic (Article 57 b); Toxic for reproduction (Article 57 c); PBT (Article 57 d); vPvB (Article 57 e)
170	4,4'-isopropylidenediphenol (Bisphenol A, BPA)	80-05-7	Toxic for reproduction (Article 57 c)
171	Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts	335-76-2, 3830-45-3, 3108-42-7	Toxic for reproduction (Article 57 c); PBT (Article 57 d)
172	4-Heptylphenol, branched and linear	--	Equivalent level of concern having probable serious effects to the environment (Article 57 f)
173	p-(1,1-dimethylpropyl)phenol (pentylphenol, PTAP)	80-46-6	Equivalent level of concern having probable serious effects to the environment (Article 57 f)

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174	Perfluorohexane-1-sulphonic acid and its salts (PFHxS)	355-46-4	vPvB (Article 57e)
175	1,6,7,8,9,14,15,16,17,17,18,18-Dodecachloropentacyclo [12.2.1.1.16,9.02,13.05,10]octadeca-7,15-diene ("Dechlorane Plus"™) [covering any of its individual anti- and syn-isomers or any combination thereof]	13560-89-9, 135821-74-8, 135821-03-3	vPvB(Article 57 e)
176	Benz[a]anthracene	56-55-3	Carcinogenic (Article 57 a); Mutagenic (Article 57 b); vPvB(Article 57 e)
177	Cadmium nitrate	10325-94-7	Carcinogenic (Article 57 a); Mutagenic (Article 57 b); Equivalent level of concern having probable serious effects to human health (Article 57 f)
178	Cadmium carbonate	513-78-0	Carcinogenic (Article 57 a); Mutagenic (Article 57 b); Equivalent level of concern having probable serious effects to human health (Article 57 f)
179	Cadmium hydroxide	21041-95-2	Carcinogenic (Article 57 a); Mutagenic (Article 57 b); Equivalent level of concern having probable serious effects to human health (Article 57 f)
180	Chrysene	218-01-9	Carcinogenic (Article 57 a); Mutagenic (Article 57 b); vPvB(Article 57 e)
181	Reaction products of 1,3,4-thiadiazolidine-2,5-dithione, formaldehyde and 4-heptylphenol, branched and linear (RP-HP) [with ≥0.1% w/w 4-heptylphenol, branched and linear]	--	Equivalent level of concern having probable serious effects to human health (Article 57 f)
182	Benzene-1,2,4-tricarboxylic acid 1,2-anhydride (trimellitic anhydride) (TMA)	552-30-7	Respiratory sensitising properties (Article 57(f)) – human health)
183	Dicyclohexyl phthalate (DCHP)	84-61-7	Toxic for reproduction (Article 57(c)); endocrine disrupting properties (Article 57(f) - human health)
184	Octamethylcyclotetrasiloxane (D4)	556-67-2	PBT (Article 57d); vPvB (Article 57e)
185	Decamethylcyclopentasiloxane (D5)	541-02-6	PBT (Article 57d);

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			vPvB (Article 57e)
186	Dodecamethylcyclodhexasiloxane (D6)	540-97-6	PBT (Article 57d); vPvB (Article 57e)
187	Lead	7439-92-1	Toxic for reproduction (Article 57c)
188	Disodium octaborate	12008-41-2	Toxic for reproduction (Article 57c)
189	Benzo[ghi]perylene	191-24-2	PBT (Article 57d); vPvB (Article 57e)
190	Terphenyl hydrogenated	61788-32-7	vPvB (Article 57e)
191	Ethylenediamine (EDA)	107-15-3	Respiratory sensitising properties (Article 57(f) - human health)
192	2,2-bis(4'-hydroxyphenyl)-4-methylpentane	6807-17-6	Toxic for reproduction (Article 57c)
193	1,7,7-trimethyl-3-(phenylmethylene)bicyclo[2.2.1]heptan-2-one (3-benzylidene camphor)	15087-24-8	Endocrine disrupting properties (Article 57(f) - environment)
194	Benzo[k]fluoranthene	207-08-9	Carcinogenic (Article 57a); PBT (Article 57d); vPvB (Article 57e)
195	Fluoranthene	206-44-0	PBT (Article 57d); vPvB (Article 57e)
196	Phenanthrene	85-01-8	vPvB (Article 57e)
197	Pyrene	129-00-0	PBT (Article 57d); vPvB (Article 57e)
198	2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)propionic acid, its salts and its acyl halides (covering any of their individual isomers and combinations thereof)	--	Equivalent level of concern having probable serious effects on the environment (Article 57f) Equivalent level of concern having probable serious effects on human health (Article 57f)
199	2-methoxyethyl acetate	110-49-6	Toxic for reproduction (Article 57c)
200	Tris(4-nonylphenyl, branched and linear) phosphite (TNPP) with ≥ 0.1% w/w of 4-nonylphenol, branched and linear (4-NP)	--	Endocrine disrupting properties (Article 57(f) – environment)

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201	4-tert-butylphenols (PTBP)	98-54-4	Endocrine disrupting properties (Article 57(f) – environment)
202	Diisohexyl phthalate	71850-09-4	Toxic for reproduction (Article 57c)
203	2-benzyl-2-dimethylamino-4'-morpholinobutyrophenone	119313-12-1	Toxic for reproduction (Article 57c)
204	2-methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one	71868-10-5	Toxic for reproduction (Article 57c)
205	Perfluorobutane sulfonic acid (PFBS) and its salts	--	Equivalent level of concern having probable serious effects on the environment (Article 57f) Equivalent level of concern having probable serious effects on human health (Article 57f)
206	1-vinylimidazole	1072-63-5	Toxic for reproduction (Article 57c)
207	2-methylimidazole	693-98-1	Toxic for reproduction (Article 57c)
208	Butyl 4-hydroxybenzoate	94-26-8	Endocrine disrupting properties (Article 57(f) - human health)
209	Dibutylbis(pentane-2,4-dionato-O,O')tin	22673-19-4	Toxic for reproduction (Article 57c)
210	Bis(2-(2-methoxyethoxy)ethyl)ether	143-24-8	Toxic for reproduction (Article 57c)
211	Diocetyl tin dilaurate, stannane, dioctyl-, bis(coco acyloxy) derivs., and any other stannane, dioctyl-, bis(fatty acyloxy) derivs. wherein C12 is the predominant carbon number of the fatty acyloxy moiety	--	Toxic for reproduction (Article 57c)
212	1,4-dioxane	123-91-1	Carcinogenic (Article 57a) Equivalent level of concern having probable serious effects to human health (Article 57(f) - human health) Equivalent level of concern having probable serious effects to the environment (Article 57(f) - environment)
213	2,2-bis(bromomethyl)propane 1,3-diol (BMP), 2,2-dimethylpropan-1-ol, tribromo derivative/3-bromo-2,2-bis(bromomethyl)-1-propanol (TBNPA), 2,3-dibromo-1-propanol (2,3-DBPA)	3296-90-0, 36483-57-5/ 1522-92-5, 96-13-9	Carcinogenic (Article 57a)

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214	2-(4-tert-butylbenzyl)propionaldehyde and its individual stereoisomers	--	Toxic for reproduction (Article 57c)
215	4,4'-(1-methylpropylidene)bisphenol; (bisphenol B)	77-40-7	Endocrine disrupting properties (Article 57(f) – environment) Endocrine disrupting properties (Article 57(f) - human health)
216	Glutaral	111-30-8	Respiratory sensitising properties (Article 57(f) - human health)
217	Medium-chain chlorinated paraffins (MCCP) [UVCB substances consisting of more than or equal to 80% linear chloroalkanes with carbon chain lengths within the range from C14 to C17]	--	PBT (Article 57d) vPvB (Article 57e)
218	Orthoboric acid, sodium salt	13840-56-7	Toxic for reproduction (Article 57c)
219	Phenol, alkylation products (mainly in para position) with C12-rich branched or linear alkyl chains from oligomerisation, covering any individual isomers and/ or combinations thereof (PDDP)	--	Toxic for reproduction (Article 57c) Endocrine disrupting properties (Article 57(f) – environment) Endocrine disrupting properties (Article 57(f) - human health)
220	(±)-1,7,7-trimethyl-3-[(4-methylphenyl)methylene]bicyclo[2.2.1]heptan-2-one covering any of the individual isomers and/or combinations thereof (4-MBC)	--	Endocrine disrupting properties (Article 57(f) - human health)
221	6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol	119-47-1	Toxic for reproduction (Article 57c)
222	S-(tricyclo[5.2.1.0'2,6]deca-3-en-8(or 9)-yl) O-(isopropyl or isobutyl or 2-ethylhexyl) O-(isopropyl or isobutyl or 2-ethylhexyl) phosphorodithioate	255881-94-8	PBT (Article 57d)
223	tris(2-methoxyethoxy)vinylsilane	1067-53-4	Toxic for reproduction (Article 57c)
224	N-(hydroxymethyl)acrylamide	924-42-5	Carcinogenic (Article 57 a) Mutagenic (Article 57 b)

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**Remark:**

1. Definition of classification is listed in Appendix A of this report in accordance with 67/548/EEC and Regulation (EC) No 1907/2006.
2. The analysis of 224 SVHCs is done by currently available test & screening techniques against the SVHC candidate list published by European Chemical Agency (ECHA).  
Refer to [http://echa.europa.eu/chem\\_data/candidate\\_list\\_table\\_en.asp](http://echa.europa.eu/chem_data/candidate_list_table_en.asp) for details.
- 3.\*\*\* The substances are tested in terms of its respective elements and the test result is based on the calculation of selected elements.

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

**Prepared by:**

**Checked by:**



**Mr. Jialong HAN**

**Mr. Feng ZHANG**

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APPENDIX I: Product Model

Product: 166 PV Modules, 210 PV Modules



Remark:

- 1. The report covers material testing on specified samples.



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