

Client Name: ZHEJIANG BEYONDSUN GREEN ENERGY TECHNOLOGY CO., LTD.
 Client Address: NO.888 ZHILI SECTION OF G318 ZHILI TOWN,HUZHOU CITY,ZHEJIANG PROVINCE,CHINA

Sample Name: Photovoltaic PVModule
 Tested Basic Model No.: TSHNM415-108HV
 Client Ref. Information: TSHNM***-144HV,TSHNM***-132HV,TSHNM***-120HV,TSHNM***-108HV
 Manufacturer: Beyondsun
 Supplier: Beyondsun
 Origin of the Product(s): China
 Destination of the Product(s):Spain

The above sample(s) and information were provided by the client.

SGS Job No.: NBP23-002911
 Sample Receiving Date: Sep 19, 2023
 Verification Period: Sep 19, 2023 ~ Oct 27, 2023
 Verification Requested: With reference to RoHS Directive (EU) 2015/863 amending 2011/65/EU.
 Verification Method(s): Please refer to next page(s).
 Verification Result(s): Please refer to next page(s).

Test Result Summary:

Test Items	Conclusion
EU RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU- Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP)	Pass

Signed for and on behalf of
 SGS-CSTC Standards Technical Services Co., Ltd. Ningbo Branch

Damon Li

Damon Li
 Approved Signatory

scan to see the report



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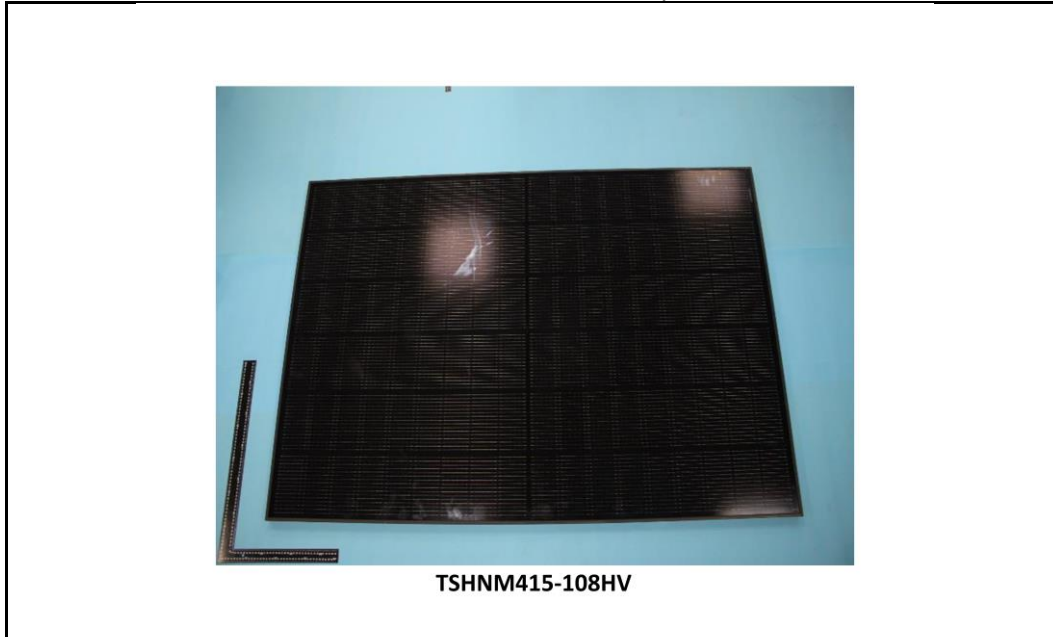
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Photo of Submitted Sample



Verification Method(s):

1. With reference to IEC 62321-2:2021, disassembly and disjointment were performed for the submitted samples.
2. With reference to IEC 62321-1:2013, tests were performed for the samples indicated by the photos in this report.
 - (1) With reference to IEC 62321-3-1:2013, screening by EDXRF spectroscopy.
 - (2) Wet chemical test method: With reference to IEC 62321-4:2013+A1:2017, IEC62321-5:2013, IEC 62321-7-1:2015, IEC 62321-7-2:2017, ISO 17075-1:2017, IEC 62321-6:2015 and IEC62321-8:2017 , analyzed by ICP-OES,UV-Vis and GC-MS.



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Verification Part Description:

SN ID	Sample No.	SGS Sample ID	Description
SN1	A1	NGB23-0043648-0001.C001	TSHNM415-108HV-White solid adhesive lump
SN2	A2	NGB23-0043648-0001.C002	TSHNM415-108HV-Beige plastic lump
SN3	A3	NGB23-0043648-0001.C003	TSHNM415-108HV-Black solid adhesive lump
SN4	A4	NGB23-0043648-0001.C004	TSHNM415-108HV-Black plastic shell
SN5	A5	NGB23-0043648-0001.C005	TSHNM415-108HV-Black plastic cover
SN6	A6	NGB23-0043648-0001.C006	TSHNM415-108HV-Black plastic jacket
SN7	A7	NGB23-0043648-0001.C007	TSHNM415-108HV-Silvery metal pin
SN8	A8	NGB23-0043648-0001.C008	TSHNM415-108HV-Black plastic shell
SN9	A9	NGB23-0043648-0001.C009	TSHNM415-108HV-Orange rubber lump
SN10	A10	NGB23-0043648-0001.C010	TSHNM415-108HV-Black plastic shell
SN11	A11	NGB23-0043648-0001.C011	TSHNM415-108HV-Silvery plastic label
SN12	A12	NGB23-0043648-0001.C012	TSHNM415-108HV-White plastic piece
SN13	A13	NGB23-0043648-0001.C013	TSHNM415-108HV-Black electron component
SN14	A14	NGB23-0043648-0001.C014	TSHNM415-108HV-Black metal bracket
SN15	A15	NGB23-0043648-0001.C015	TSHNM415-108HV-Black rubber ring



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Verification Result(s):

In accordance with the result of material risk assessment, the following disjointed parts in the submitted sample have been verified. (Unless otherwise specified, the unit is mg/kg).

Test Item(s)	A1	A2	A3	A4	A5	A6	A7	A8
Cd	BL	BL	BL	BL	BL	BL	BL	BL
Pb	BL	BL	BL	BL	BL	BL	BL	BL
Hg	BL	BL	BL	BL	BL	BL	BL	BL
Cr(VI)▼	BL	BL	BL	BL	BL	BL	ND	BL
PBBs	BL	BL	BL	BL	BL	BL	---	BL
PBDEs	BL	BL	BL	BL	BL	BL	---	BL
DBP	BL	BL	BL	BL	BL	BL	---	BL
BBP	BL	BL	BL	BL	BL	BL	---	BL
DEHP	BL	BL	BL	BL	BL	BL	---	BL
DIBP	BL	BL	BL	BL	BL	BL	---	BL
Conclusion	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

Test Item(s)	A9	A10	A11	A12	A13	A14	A15
Cd	BL	BL	BL	BL	BL	BL	BL
Pb	BL	BL	BL	BL	<100000 0▲	BL	BL
Hg	BL	BL	BL	BL	BL	BL	BL
Cr(VI)▼	BL	BL	BL	BL	BL	BL	BL
PBBs	BL	BL	BL	BL	BL	---	BL
PBDEs	BL	BL	BL	BL	BL	---	BL
DBP	BL	BL	BL	BL	BL	---	ND
BBP	BL	BL	BL	BL	BL	---	ND
DEHP	BL	BL	BL	BL	BL	---	ND
DIBP	BL	BL	BL	BL	BL	---	ND
Conclusion	PASS	PASS	PASS	PASS	PASS	PASS	PASS



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Notes:

- (1) Interpretation of screening results by X-ray fluorescence spectrometry (XRF):
 (a) Screening limits in mg/kg for regulated elements in various matrices according to IEC 62321-1:2013 Annex A as below table.

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	$BL \leq (300-3\sigma) < X$	Not applicable	$BL \leq (250-3\sigma) < X$
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$

- (b) If the maximum allowed level restricts PBB/PBDE and Cr(VI) rather than Br and Cr, the exceptions are the XRF determinations of Br and Cr. If the quantitative results for the elements Br and/or are higher than the limit (for Br calculated based on the stoichiometry of Br in the most common congeners of PBB/PBDE), the sample is "inconclusive".
 (c) Results are obtained by EDXRF for primary screening, LOD = Limit of Detection, BL = Below Limit, OL= Over Limit, IN (The symbol X marks the region)=Inconclusive, where further investigation is necessary, and further chemical testing by ICP-OES (for Cd, Pb, Hg), UV-Vis (for Cr(VI)) and GC-MS (for PBBs/PBDEs) are recommended to be performed.
 (d) The EDXRF screening test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.

- (2) Screening results of Phthalates (PHTH) are for primary screening, and further chemical testing by GC-MS (for DBP, BBP, DEHP and DIBP) are recommended to be performed if the concentration exceeds the below warning value (unit: mg/kg).

Test Items	CAS No.	Polymer/ Composite Materials
Dibutyl Phthalate (DBP)	84-74-2	$BL \leq 600 < X$
Benzylbutyl Phthalate (BBP)	85-68-7	$BL \leq 600 < X$
Bis(2-ethylhexyl) Phthalate (DEHP)	117-81-7	$BL \leq 600 < X$
Diisobutyl Phthalate (DIBP)	84-69-5	$BL \leq 600 < X$

- (3) Interpretation of results by chemical tests:
 (a) mg/kg = 0.0001%, MDL=Method detection Limit, ND = Not Detected (<MDL), --- = Not Applicable.
 (b) Unit and MDL in wet chemical test

Test Items	Pb	Cd	Hg	DBP	BBP	DEHP	DIBP
Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MDL	10	10	10	100	100	100	100

The MDL for single compound of PBBs and PBDEs is 100 mg/kg,
 MDL of Cr(VI) for polymer, composite and leather sample is 10 mg/kg.
 MDL of Cr(VI) for metal sample is 0.10 µg/cm².

- (c) ▼ =Metal sample
 a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 µg/cm². The sample coating is considered to contain Cr(VI).
 b. The sample is negative for Cr(VI) if Cr(VI) is ND (concentration less than 0.10 µg/cm²). The coating is considered a non-Cr(VI) based coating
 c. The result between 0.10 µg/cm² and 0.13 µg/cm² is considered to be inconclusive-unavoidable coating variations may influence the determination



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Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.

(4) Restricted substances and maximum concentration values tolerated by weight in homogeneous materials under RoHS Directive: Cd: 0.01%, Pb/Hg/Cr(VI)/PBBs/PBDEs/DEHP/DBP/BBP/DIBP: 0.1%. The limit is quoted from RoHS Directive (EU) 2015/863.

(5) IEC 62321 series is equivalent to EN 62321 series.

(6)▲=According to the declaration from the client, Lead (Pb) in A13 is exempted by EU RoHS directive 2011/65/EU based on [ANNEX III 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.

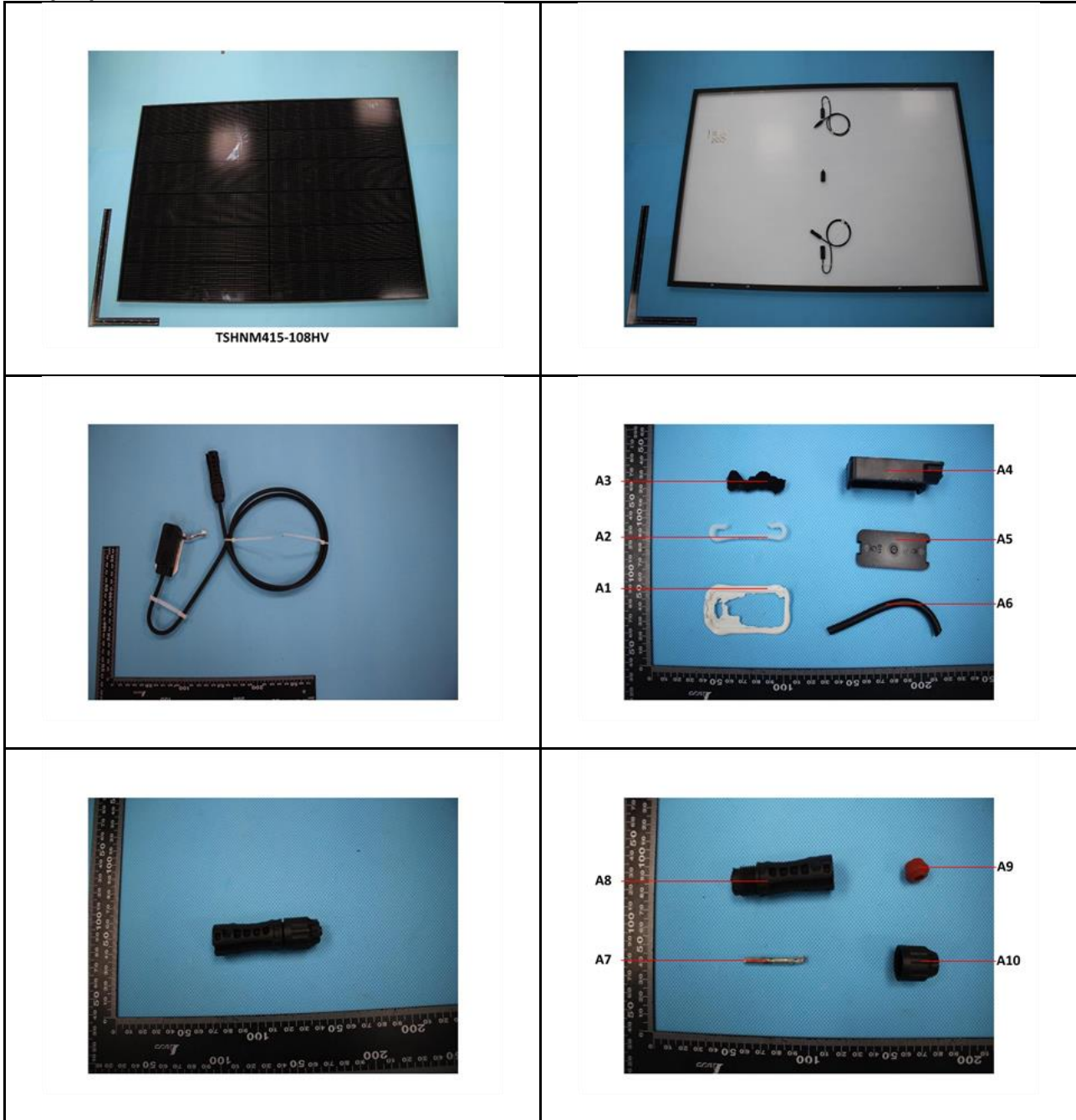
(7) According to the declaration from applicant, the materials of Model "TSHNM415-108HV" are the same as those in Model mentioned in Client Ref. Information and its results for support the results of Model mentioned in Client Ref. Information. The applicant will take the responsibility of all discrepancy and risk.

Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule ($w=0$) stated in ILAC-G8:09/2019.



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Sample photos:



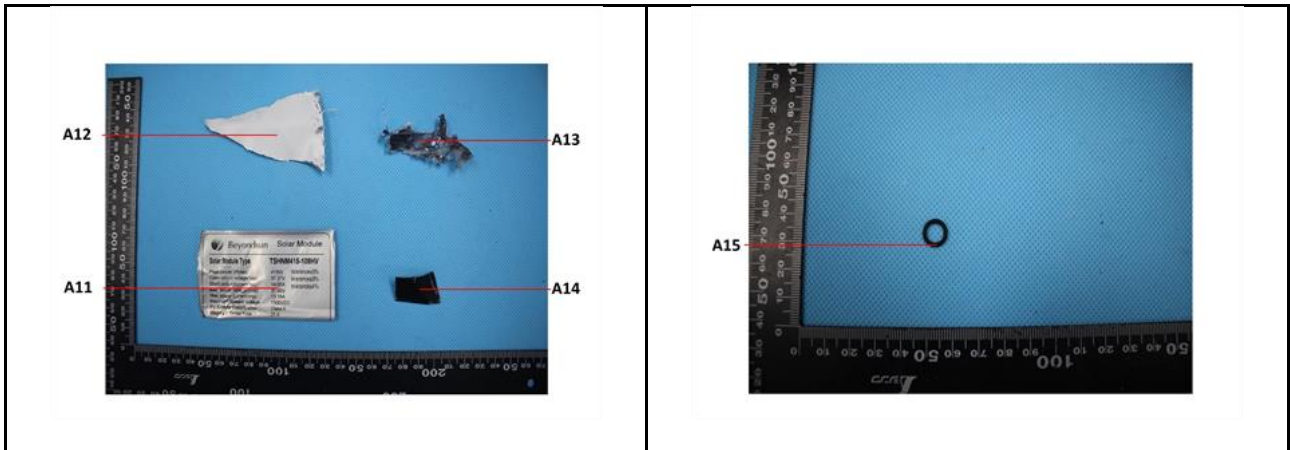
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