

Client Name: Shanghai JA Solar Technology Co., Ltd.

Client Address: No 118,Lane 3111,West Huangcheng Road,Fengxian District, 201401 Shanghai,P.R.China

Sample Name: Mono crystalline silicon photovoltaic (PV) modules

Client Ref. Information: Please refer to remark (6)

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

SGS Job No.: TIC1020230425150302QTZH

Sample Receiving Date: May 16, 2023

Verification Period: May 16, 2023 ~ Jun 16, 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).

Signed for and on behalf of
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

Jessica Chen

Jessica Chen
Approved Signatory

scan to see the report



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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	SHA23-0061706-0001.C001	Silvery metal (frame)
SN2	A2	SHA23-0061706-0001.C002	Silvery metal (frame)
SN3	A3	SHA23-0061706-0001.C003	Black sensitive plate (body)
SN4	A4	SHA23-0061706-0001.C004	Black/White adhesive plastic (label)
SN5	A5	SHA23-0061706-0001.C005	Silvery/Black adhesive plastic (label)
SN6	A6	SHA23-0061706-0001.C006	White adhesive (gasket cement)
SN7	A7	SHA23-0061706-0001.C007	Silvery metal (guide vane)
SN8	A8	SHA23-0061706-0001.C008	Black plastic (cover plate)
SN9	A9	SHA23-0061706-0001.C009	Black plastic (fixed block)
SN10	A10	SHA23-0061706-0001.C010	Black plastic (shell)
SN11	A11	SHA23-0061706-0001.C011	Black IC (body)
SN12	A12	SHA23-0061706-0001.C012	Silvery metal (pin)
SN13	A13	SHA23-0061706-0001.C013	Black plastic (boot)
SN14	A14	SHA23-0061706-0001.C014	Black plastic (boot)
SN15	A15	SHA23-0061706-0001.C015	Black plastic (boot)
SN16	A16	SHA23-0061706-0001.C016	Black rubber (boot)
SN17	A17	SHA23-0061706-0001.C017	Red rubber (washer)
SN18	A18	SHA23-0061706-0001.C018	Silvery metal (guide vane)
SN19	A19	SHA23-0061706-0001.C019	Silvery metal (boot)
SN20	A20	SHA23-0061706-0001.C020	Silvery metal (soldering tin)
SN21	A21	SHA23-0061706-0001.C021	Black plastic (wire sheath) (wire harness)
SN22	A22	SHA23-0061706-0001.C022	Silvery metal (wire core) (wire harness)
SN23	A23	SHA23-0061706-0001.C023	White plastic (buckle)
SN24	A24	SHA23-0061706-0001.C024	Black plastic (boot)
SN25	A25	SHA23-0061706-0001.C025	Silvery metal (soldering tin)
SN26	A26	SHA23-0061706-0001.C026	Silvery metal (boot)
SN27	A27	SHA23-0061706-0001.C027	Silvery metal (pin)
SN28	A28	SHA23-0061706-0001.C028	Yellow plastic (ribbon)
SN29	A29	SHA23-0061706-0001.C029	Black plastic (shell)
SN30	A30	SHA23-0061706-0001.C030	Transparent glass
SN31	A31	SHA23-0061706-0001.C031	Transparent glass
SN32	A32	SHA23-0061706-0001.C032	Transparent glass
SN33	A33	SHA23-0061706-0001.C033	Transparent glass
SN34	A34	SHA23-0061706-0001.C034	Silvery metal (guide vane)
SN35	A35	SHA23-0061706-0001.C035	Silvery metal (guide vane)
SN36	A36	SHA23-0061706-0001.C036	Black/White plastic (diaphragm)
SN37	A37	SHA23-0061706-0001.C037	White-transparent (diaphragm)
SN38	A38	SHA23-0061706-0001.C038	Black-transparent (diaphragm)
SN39	A39	SHA23-0061706-0001.C039	Black metal (fixed strip)
SN40	A40	SHA23-0061706-0001.C040	Black plastic (diaphragm)
SN41	A41	SHA23-0061706-0001.C041	Blue sensitive plate (body)
SN42	A42	SHA23-0061706-0001.C042	Blue sensitive plate (body)
SN43	A43	SHA23-0061706-0001.C043	White adhesive (gasket cement)
SN44	A44	SHA23-0061706-0001.C044	Transparent adhesive plastic (positioning tape)
SN45	A45	SHA23-0061706-0001.C045	Silvery metal (guide vane)



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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	35347	BL
Hg	BL	BL	BL	BL	BL	BL	BL	BL
Cr(VI)▼	BL	BL	BL	BL	BL	BL	BL	BL
PBBs	---	---	BL	BL	BL	BL	---	BL
PBDEs	---	---	BL	BL	BL	BL	---	BL
DBP	---	---	BL	BL	BL	BL	---	BL
BBP	---	---	BL	BL	BL	BL	---	BL
DEHP	---	---	BL	BL	BL	BL	---	BL
DIBP	---	---	BL	BL	BL	BL	---	BL

Test Item(s)	A9	A10	A11	A12	A13	A14	A15	A16
Cd	BL	BL	BL	BL	BL	BL	BL	BL
Pb	BL	BL	OL	314585	BL	BL	BL	BL
Hg	BL	BL	BL	BL	BL	BL	BL	BL
Cr(VI)▼	BL	BL	BL	BL	BL	BL	BL	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

Test Item(s)	A17	A18	A19	A20	A21	A22	A23	A24
Cd	BL	BL	BL	BL	BL	BL	BL	BL
Pb	BL	BL	BL	383	BL	BL	BL	BL
Hg	BL	BL	BL	BL	BL	BL	BL	BL
Cr(VI)▼	BL	ND	ND	ND	BL	BL	BL	BL
PBBs	BL	---	---	---	BL	---	BL	BL
PBDEs	BL	---	---	---	BL	---	BL	BL
DBP	BL	---	---	---	BL	---	BL	BL
BBP	BL	---	---	---	BL	---	BL	BL
DEHP	BL	---	---	---	BL	---	BL	BL
DIBP	BL	---	---	---	BL	---	BL	BL

Test Item(s)	A25	A26	A27	A28	A29	A30	A31	A32
Cd	BL	BL	BL	BL	BL	BL	BL	BL
Pb	497	BL	115692	BL	BL	BL	BL	BL
Hg	ND	BL	BL	BL	BL	BL	BL	BL
Cr(VI)▼	BL	ND	BL	BL	BL	BL	BL	BL
PBBs	---	---	---	BL	BL	BL	BL	BL
PBDEs	---	---	---	BL	BL	BL	BL	BL
DBP	---	---	---	BL	BL	---	---	---



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Test Item(s)	A25	A26	A27	A28	A29	A30	A31	A32
BBP	---	---	---	BL	BL	---	---	---
DEHP	---	---	---	BL	BL	---	---	---
DIBP	---	---	---	BL	BL	---	---	---

Test Item(s)	A33	A34	A35	A36	A37	A38	A39	A40
Cd	BL	BL	BL	BL	BL	BL	BL	BL
Pb	BL	26670	35856	BL	BL	BL	BL	BL
Hg	BL	BL	ND	BL	BL	BL	BL	BL
Cr(VI)▼	BL	ND	BL	BL	BL	ND	BL	BL
PBBs	BL	---	---	BL	BL	BL	---	BL
PBDEs	BL	---	---	BL	BL	BL	---	BL
DBP	---	---	---	BL	BL	BL	---	BL
BBP	---	---	---	BL	BL	BL	---	BL
DEHP	---	---	---	BL	BL	BL	---	BL
DIBP	---	---	---	BL	BL	BL	---	BL

Test Item(s)	A41	A42	A43	A44	A45
Cd	BL	BL	BL	BL	BL
Pb	BL	BL	BL	BL	23527
Hg	BL	BL	BL	BL	BL
Cr(VI)▼	BL	BL	BL	BL	BL
PBBs	BL	BL	BL	BL	---
PBDEs	BL	BL	BL	BL	---
DBP	BL	BL	BL	BL	---
BBP	BL	BL	BL	BL	---
DEHP	BL	BL	BL	BL	---
DIBP	BL	BL	BL	BL	---



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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) Client Ref. Information:

Maximum System Voltage: 1500 V or 1000V DC

- JAM72S30-555/LR, JAM72S30-560/LR, JAM72S30-565/LR, JAM72S30-570/LR,
- JAM72S30-575/LR, JAM72S30-580/LR, JAM72S30-585/LR
- JAM54S30-410/LR, JAM54S30-415/LR, JAM54S30-420/LR, JAM54S30-425/LR,
- JAM54S30-430/LR, JAM54S30-435/LR, JAM54S30-440/LR
- JAM54S31-410/LR, JAM54S31-415/LR, JAM54S31-420/LR, JAM54S31-425/LR,
- JAM54S31-430/LR, JAM54S31-435/LR, JAM54S31-440/LR
- JAM78S30-580/MR, JAM78S30-585/MR, JAM78S30-590/MR, JAM78S30-595/MR,
- JAM78S30-600/MR, JAM78S30-605/MR
- JAM72S30-535/MR, JAM72S30-540/MR, JAM72S30-545/MR, JAM72S30-550/MR,
- JAM72S30-555/MR
- JAM66S30-495/MR, JAM66S30-500/MR, JAM66S30-505/MR, JAM66S30-510/MR
- JAM54S30-390/MR, JAM54S30-395/MR, JAM54S30-400/MR, JAM54S30-405/MR,
- JAM54S30-410/MR, JAM54S30-415/MR, JAM54S30-420/MR, JAM54S30-425/MR
- JAM72S30-535/GR, JAM72S30-540/GR, JAM72S30-545/GR, JAM72S30-550/GR,
- JAM72S30-555/GR, JAM72S30-560/GR, JAM72S30-565/GR
- JAM54S30-390/GR, JAM54S30-395/GR, JAM54S30-400/GR, JAM54S30-405/GR,
- JAM54S30-410/GR, JAM54S30-415/GR, JAM54S30-420/GR, JAM54S30-425/GR
- JAM54S30-410/LB, JAM54S30-415/LB, JAM54S30-420/LB, JAM54S30-425/LB,
- JAM54S30-430/LB, JAM54S30-435/LB, JAM54S30-440/LB
- JAM54S31-410/LB, JAM54S31-415/LB, JAM54S31-420/LB, JAM54S31-425/LB,
- JAM54S31-430/LB, JAM54S31-435/LB, JAM54S31-440/LB
- JAM54S30-390/MB, JAM54S30-395/MB, JAM54S30-400/MB, JAM54S30-405/MB,
- JAM54S30-410/MB, JAM54S30-415/MB, JAM54S30-420/MB, JAM54S30-425/MB
- JAM54S31-390/MB, JAM54S31-395/MB, JAM54S31-400/MB, JAM54S31-405/MB,
- JAM54S31-410/MB, JAM54S31-415/MB
- JAM54S31-390/MR, JAM54S31-395/MR, JAM54S31-400/MR, JAM54S31-405/MR,
- JAM54S31-410/MR, JAM54S31-415/MR, JAM54S31-420/MR, JAM54S31-425/MR
- JAM72S20-440/MR, JAM72S20-445/MR, JAM72S20-450/MR, JAM72S20-455/MR,



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JAM72S20-460/MR, JAM72S20-465/MR, JAM72S20-470/MR
 JAM60S20-365/MR, JAM60S20-370/MR, JAM60S20-375/MR, JAM60S20-380/MR,
 JAM60S20-385/MR, JAM60S20-390/MR
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 JAM60S21-385/MR, JAM60S21-390/MR
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Maximum System Voltage: 1000V DC

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JAM54S30-390/MB/1000V, JAM54S30-395/MB/1000V, JAM54S30-400/MB/1000V, JAM54S30-405/MB/1000V, JAM54S30-410/MB/1000V, JAM54S30-415/MB/1000V, JAM54S30-420/MB/1000V, JAM54S30-425/MB/1000V

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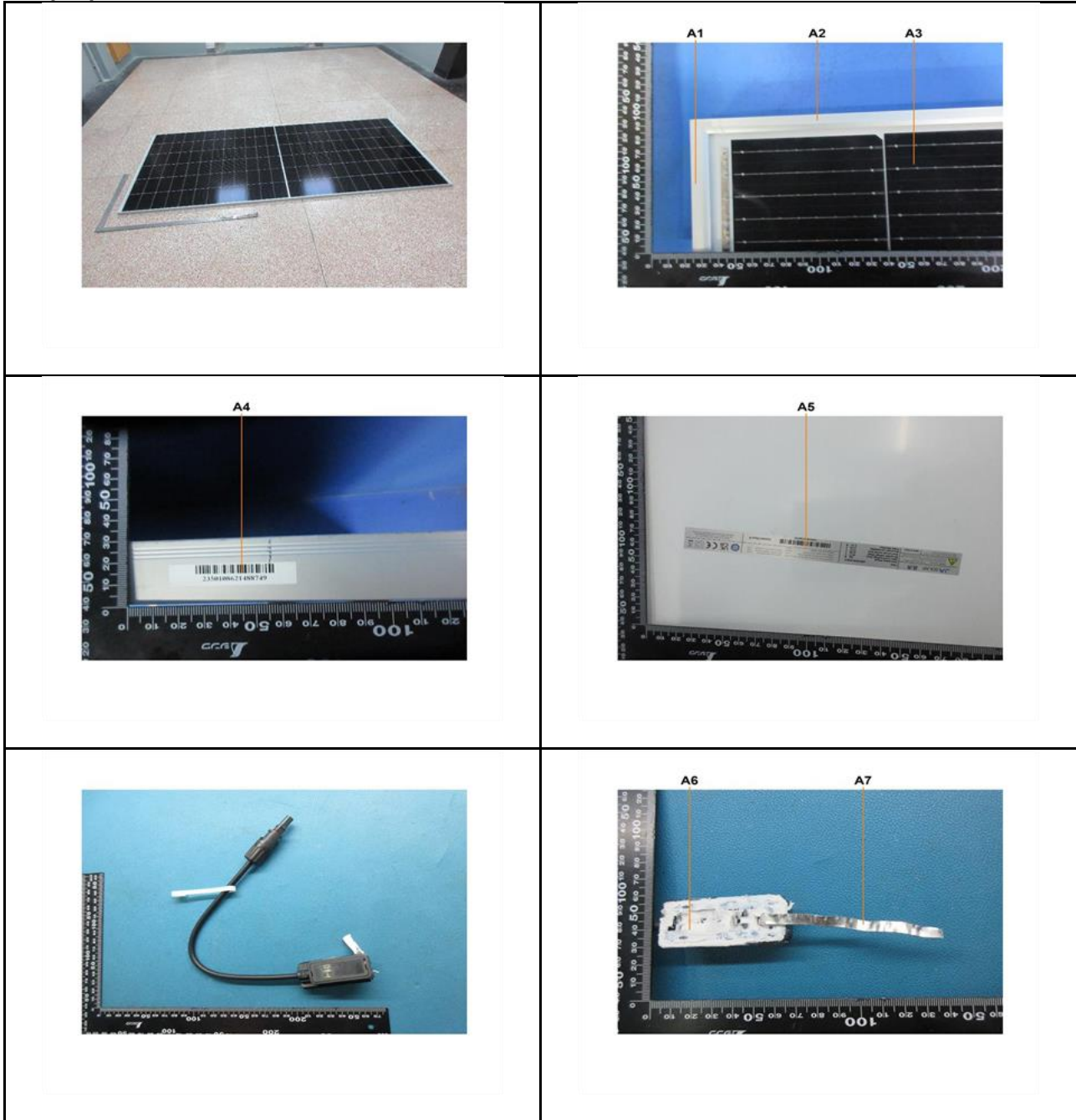
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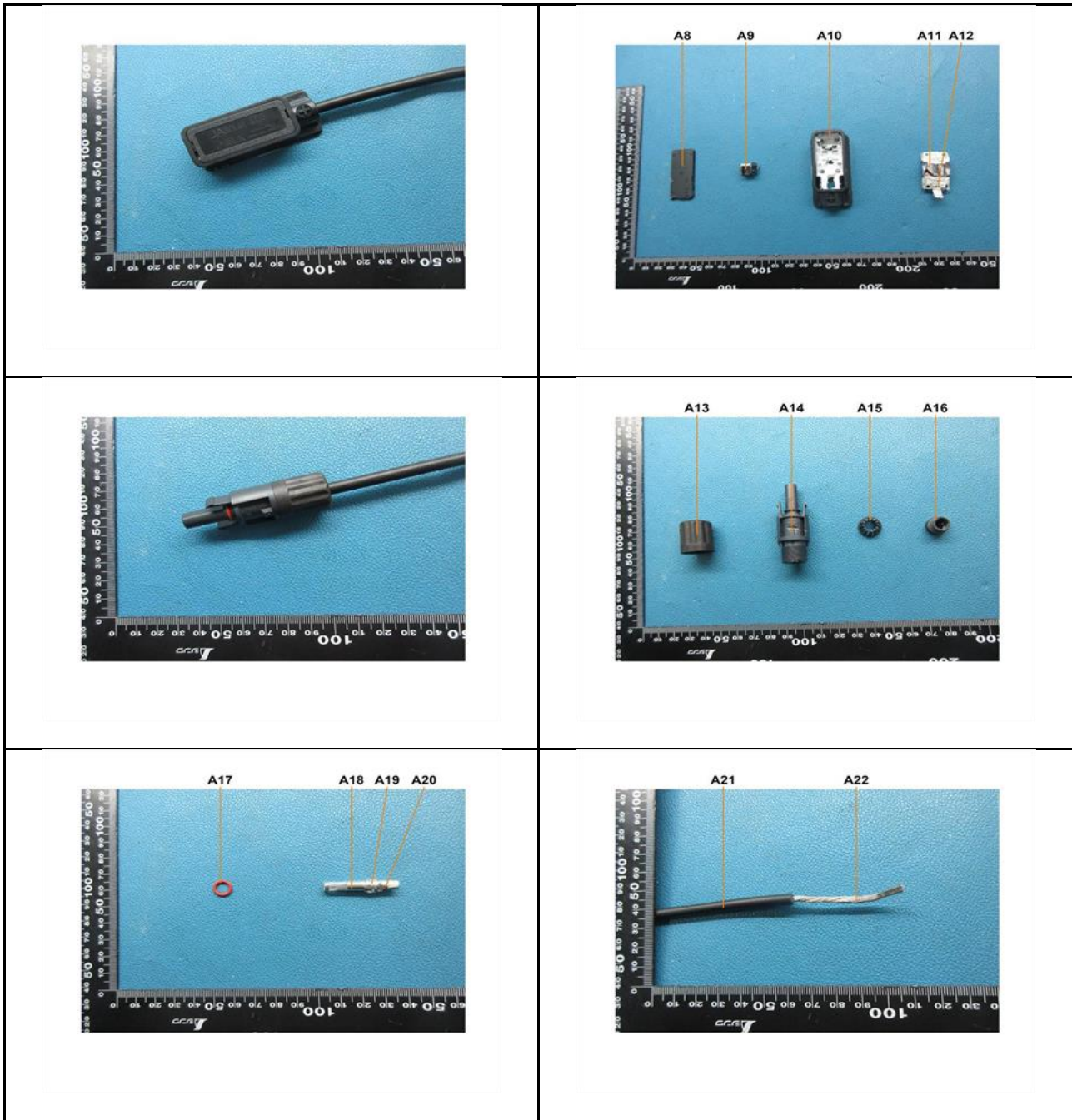
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Sample photos:



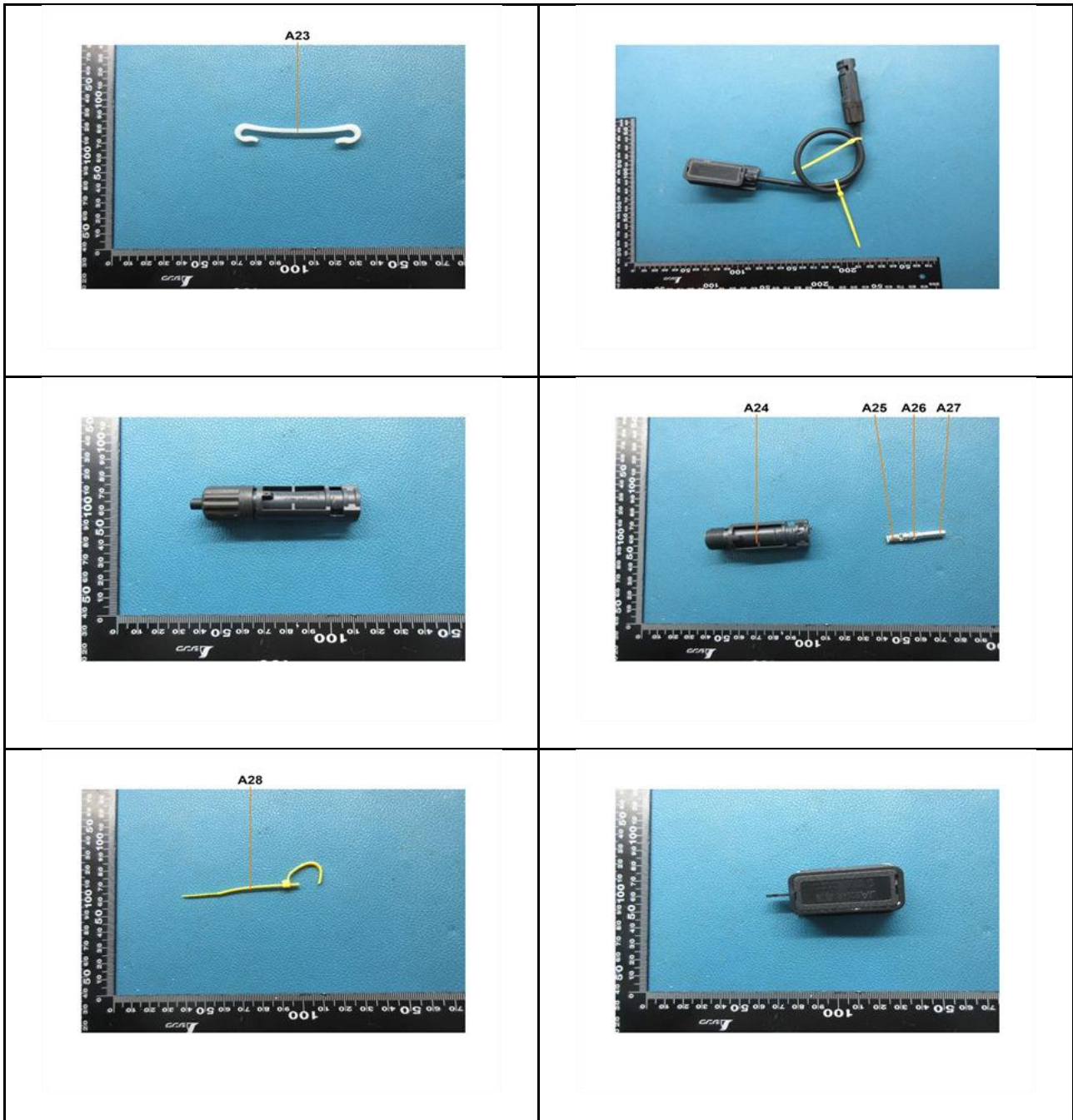


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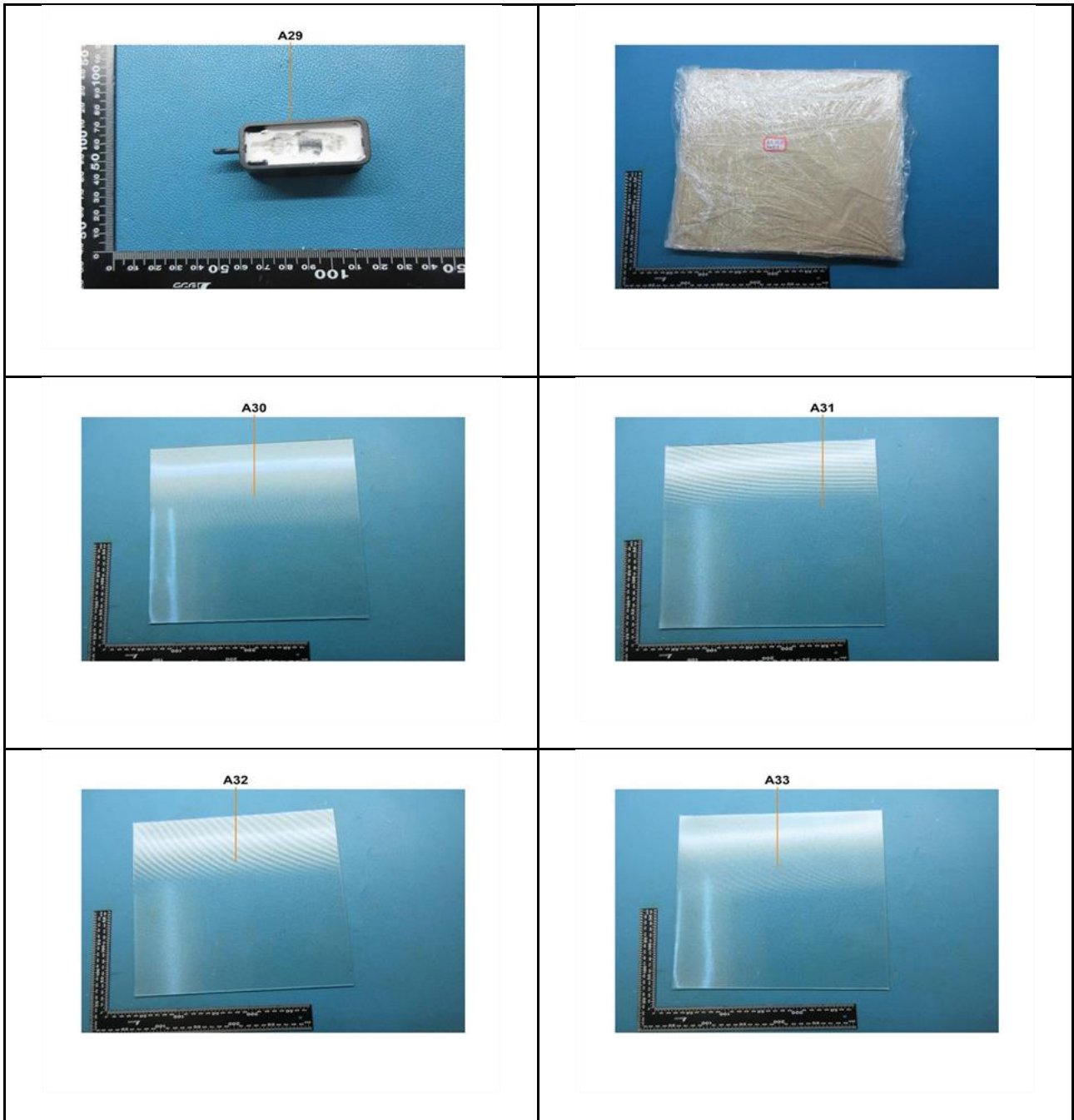
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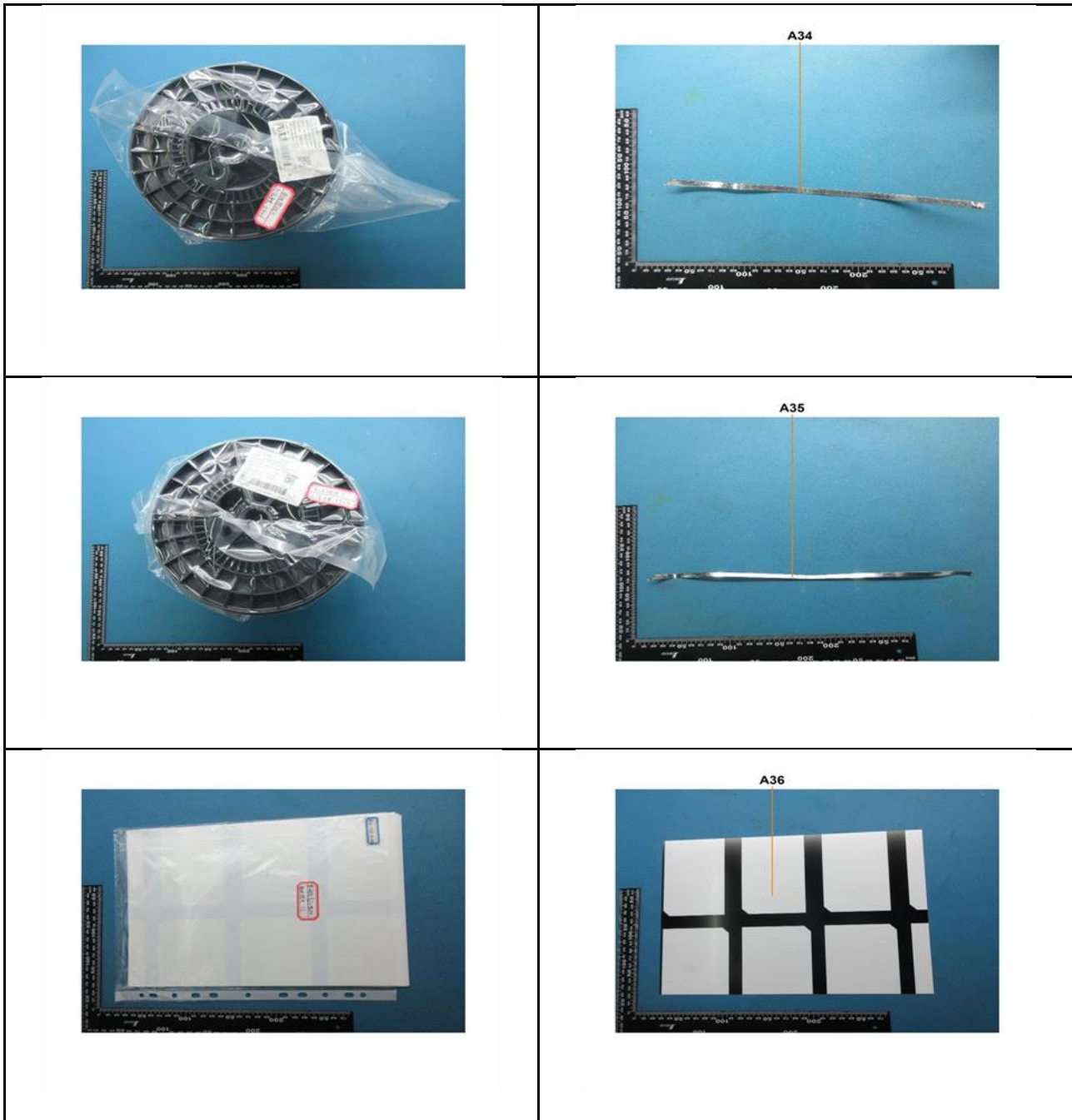


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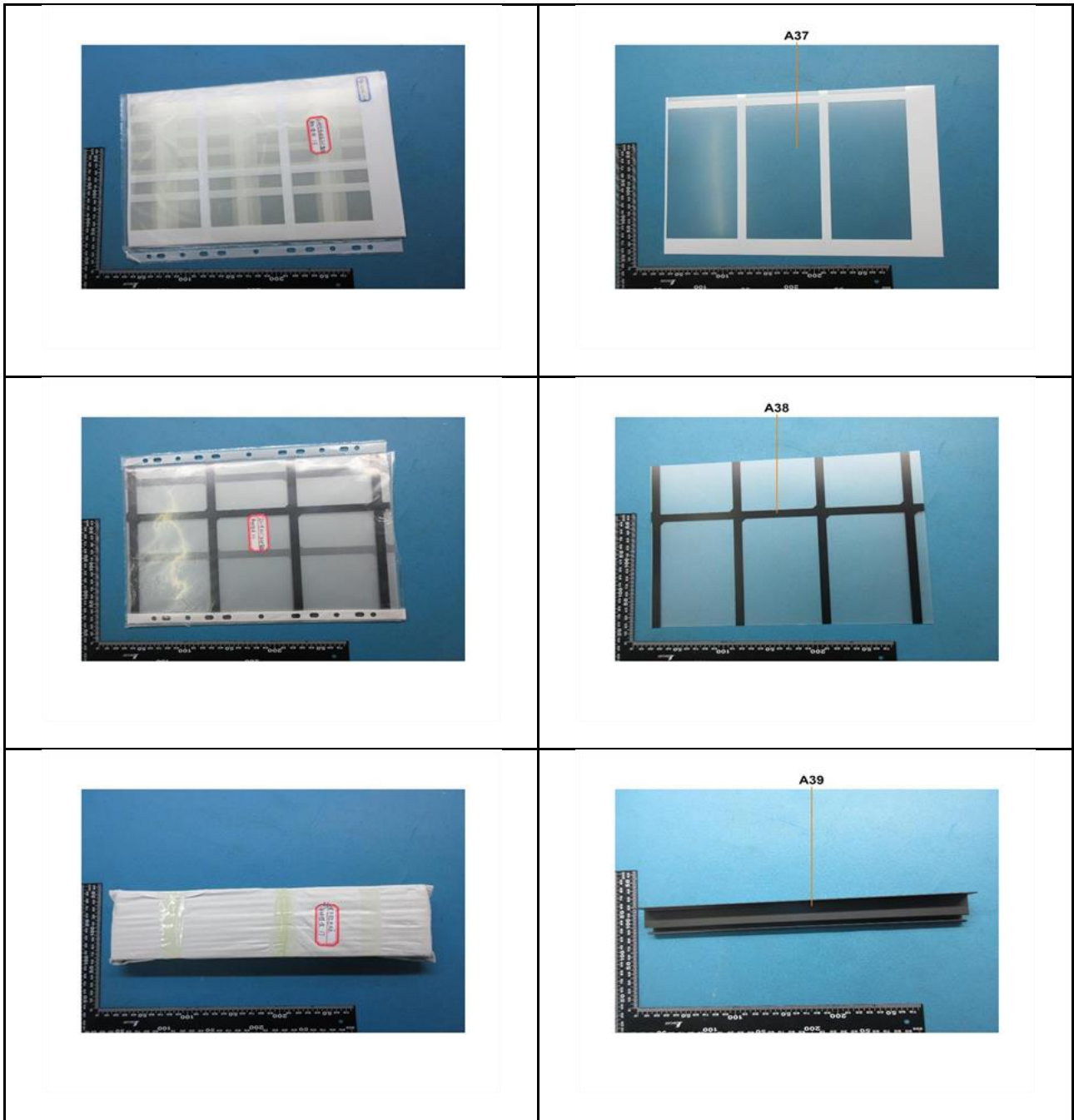
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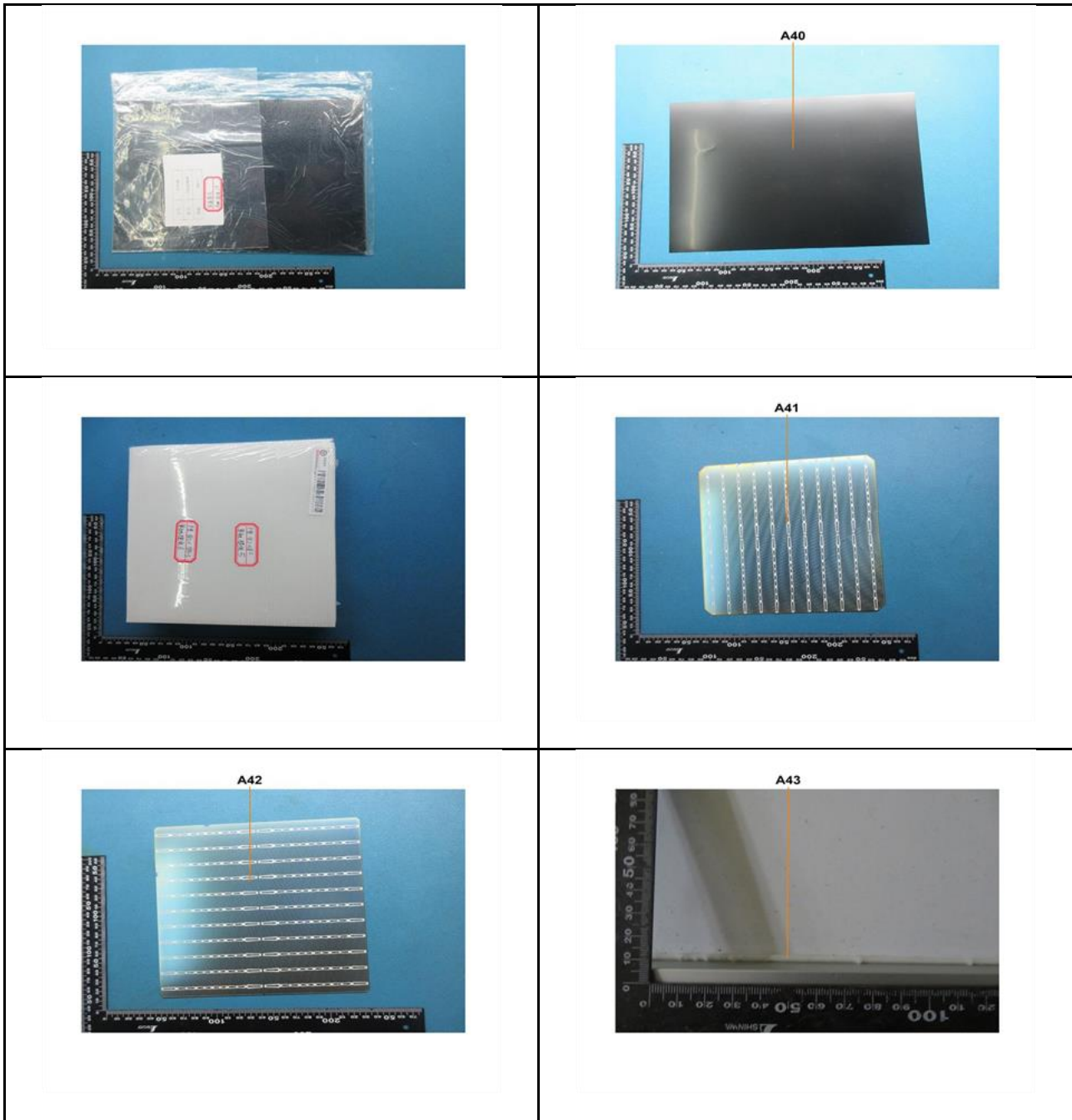


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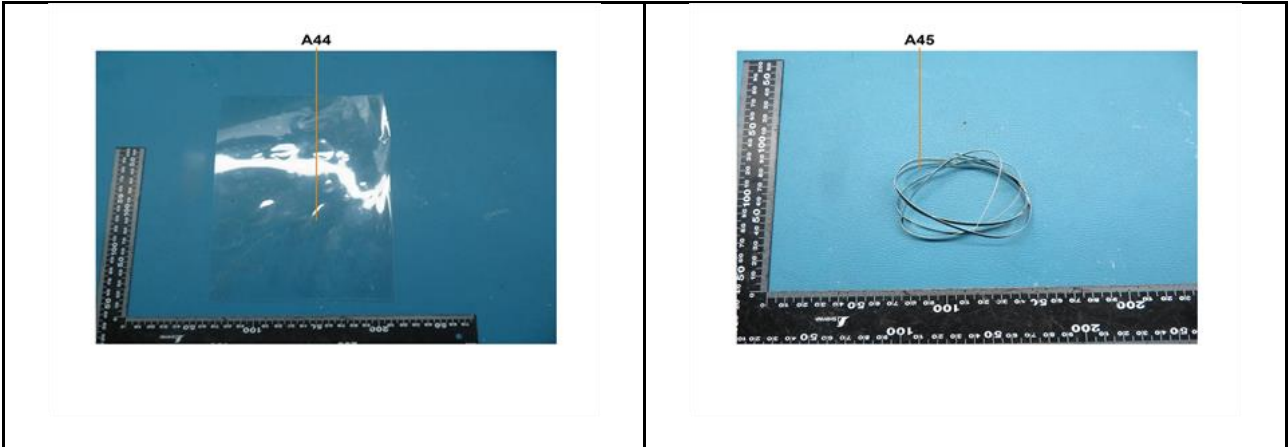


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