

Verification Report

No.: CANEC1827121401

Date: 29 Dec 2018

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ZHONGSHAN FORTUNE-WAY ENVIRONMENTAL TECHNOLOGY CO., LTD.
ROOM 501, 5TH FLOOR, BUILDING 2, NO.1 LIANLI ROAD, TORCH DEVELOPMENT ZONE, ZHONGSHAN

Sample Name : Total heat exchanger
SGS Job No. : CP18-069883 – GZ
Internal Ref No. : 2.1
Test Basic Model No. (P.O. No.) : 400*200*200
Data of Sample Received : 27 Jul 2018
Verification Period : 27 Jul 2018 – 24 Aug 2018

Verification Requested: : With reference to RoHS Directive (EU) 2015/863 amending 2011/65/EU.

Verification Method : Please refer to next page(s)

Verification Results : Please refer to next page(s)

Verification Conclusion : Based on the verification results of the submitted samples, the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP) , Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) , and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Note : The test results are related only to the tested items. The report shall not be reproduced except in full without the written approval of the testing laboratory.

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



Jenny Liao
Approved Signatory



SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch Testing Center Chemical Laboratory.

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Verification Method:

1. With reference to IEC 62321-2:2013, review was performed for the samples disjointed from the submitted articles.
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
 - a. With reference to IEC 62321-5:2013, determination of Cadmium by ICP-OES
 - b. With reference to IEC 62321-5:2013, determination of Lead by ICP-OES
 - c. With reference to IEC 62321-4:2013+A1:2017, determination of Mercury by ICP-OES
 - d. With reference to IEC 62321-7-1:2015, IEC 62321-7-2:2017 & ISO 17075-1:2017, determination of Hexavalent chromium by Colorimetric method using UV-Vis.
 - e. With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS
3. With reference to IEC 62321-8:2017, determination of phthalates by GC-MS.



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In accordance with the result of material risk assessment, the following disjointed parts in the submitted sample have been verified.

Details on Verification

Part No.	Part Description	BOM No.	Restricted Substances	Results of EDXRF ⁽¹⁾	Conclusion of EDXRF ⁽¹⁾	Screening Result of PHTH ⁽²⁾	Result of Wet Chemical Testing ⁽³⁾ (mg/kg)	Conclusion on EU RoHS	Sample Submitted / Resubmitted Date
1	Black adhesive sponge sheet	-	Cd	ND	BL	---	---	Comply	27 Jul 2018
			Pb	ND	BL	---	---	Comply	
			Hg	ND	BL	---	---	Comply	
			Cr(VI)	ND	BL	---	---	Comply	
			PBBs	85	BL	---	---	Comply	
			PBDEs		BL	---	---	Comply	
			DBP	---	---	---	ND	Comply	
			BBP	---	---	---	ND	Comply	
			DEHP	---	---	---	ND	Comply	
2	White plastic part	-	Cd	ND	BL	---	---	Comply	27 Jul 2018
			Pb	ND	BL	---	---	Comply	
			Hg	ND	BL	---	---	Comply	
			Cr(VI)	ND	BL	---	---	Comply	
			PBBs	ND	BL	---	---	Comply	
			PBDEs		BL	---	---	Comply	
			DBP	---	---	---	ND	Comply	
			BBP	---	---	---	ND	Comply	
			DEHP	---	---	---	ND	Comply	
3	White plastic handle	-	Cd	ND	BL	---	---	Comply	27 Jul 2018
			Pb	ND	BL	---	---	Comply	
			Hg	ND	BL	---	---	Comply	
			Cr(VI)	ND	BL	---	---	Comply	
			PBBs	ND	BL	---	---	Comply	
			PBDEs		BL	---	---	Comply	
			DBP	---	---	---	ND	Comply	
			BBP	---	---	---	ND	Comply	
			DEHP	---	---	---	ND	Comply	
4	Silvery metal rivet	-	Cd	ND	BL	---	---	Comply	27 Jul 2018
			Pb	ND	BL	---	---	Comply	
			Hg	ND	BL	---	---	Comply	
			Cr(VI)	ND	BL	---	---	Comply	
			PBBs	---	---	---	---	---	
			PBDEs		---	---	---	---	
			DBP	---	---	---	---	---	
			BBP	---	---	---	---	---	
			DEHP	---	---	---	---	---	



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5	Silvery metal (spring washer)	-	Cd	ND	BL	---	---	Comply	27 Jul 2018
			Pb	ND	BL	---	---	Comply	
			Hg	ND	BL	---	---	Comply	
			Cr(VI)▼	ND	BL	---	---	Comply	
			PBBs	---	---	---	---	---	
			PBDEs		---	---	---	---	
			DBP	---	---	---	---	---	
			BBP	---	---	---	---	---	
			DEHP	---	---	---	---	---	
			DIBP	---	---	---	---	---	
6	Silvery metal shell	-	Cd	ND	BL	---	---	Comply	27 Jul 2018
			Pb	ND	BL	---	---	Comply	
			Hg	ND	BL	---	---	Comply	
			Cr(VI)▼	1204	IN	---	ND	Comply	
			PBBs	---	---	---	---	---	
			PBDEs		---	---	---	---	
			DBP	---	---	---	---	---	
			BBP	---	---	---	---	---	
			DEHP	---	---	---	---	---	
			DIBP	---	---	---	---	---	
7	Silvery metal screw	-	Cd	ND	BL	---	---	Comply	27 Jul 2018
			Pb	195	BL	---	---	Comply	
			Hg	ND	BL	---	---	Comply	
			Cr(VI)▼	505	IN	---	ND	Comply	
			PBBs	---	---	---	---	---	
			PBDEs		---	---	---	---	
			DBP	---	---	---	---	---	
			BBP	---	---	---	---	---	
			DEHP	---	---	---	---	---	
			DIBP	---	---	---	---	---	
8	Grey sponge sheet	-	Cd	ND	BL	---	---	Comply	27 Jul 2018
			Pb	ND	BL	---	---	Comply	
			Hg	ND	BL	---	---	Comply	
			Cr(VI)▼	ND	BL	---	---	Comply	
			PBBs	78	BL	---	---	Comply	
			PBDEs		BL	---	---	Comply	
			DBP	---	---	---	ND	Comply	
			BBP	---	---	---	ND	Comply	
			DEHP	---	---	---	ND	Comply	
			DIBP	---	---	---	ND	Comply	



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Part No.	Part Description	BOM No.	Restricted Substances	Results of EDXRF ⁽¹⁾	Conclusion of EDXRF ⁽¹⁾	Screening Result of PHTH ⁽²⁾	Result of Wet Chemical Testing ⁽³⁾ (mg/kg)	Conclusion on EU RoHS	Sample Submitted / Resubmitted Date
9	White plastic part	-	Cd	ND	BL	---	---	Comply	27 Jul 2018
			Pb	ND	BL	---	---	Comply	
			Hg	ND	BL	---	---	Comply	
			Cr(VI)▼	ND	BL	---	---	Comply	
			PBBs	ND	BL	---	---	Comply	
			PBDEs		BL	---	---	Comply	
			DBP	---	---	---	ND	Comply	
			BBP	---	---	---	ND	Comply	
			DEHP	---	---	---	ND	Comply	
			DIBP	---	---	---	ND	Comply	
10	White plastic sheet	-	Cd	ND	BL	---	---	Comply	27 Jul 2018
			Pb	ND	BL	---	---	Comply	
			Hg	ND	BL	---	---	Comply	
			Cr(VI)▼	ND	BL	---	---	Comply	
			PBBs	62	BL	---	---	Comply	
			PBDEs		BL	---	---	Comply	
			DBP	---	---	---	ND	Comply	
			BBP	---	---	---	ND	Comply	
			DEHP	---	---	---	ND	Comply	
			DIBP	---	---	---	ND	Comply	
11	Silvery metal sheet	-	Cd	ND	BL	---	---	Comply	27 Jul 2018
			Pb	ND	BL	---	---	Comply	
			Hg	ND	BL	---	---	Comply	
			Cr(VI)▼	236	BL	---	---	Comply	
			PBBs	---	---	---	---	---	
			PBDEs		---	---	---	---	
			DBP	---	---	---	---	---	
			BBP	---	---	---	---	---	
			DEHP	---	---	---	---	---	
			DIBP	---	---	---	---	---	
12	White plastic tube	-	Cd	ND	BL	---	---	Comply	27 Jul 2018
			Pb	ND	BL	---	---	Comply	
			Hg	ND	BL	---	---	Comply	
			Cr(VI)▼	ND	BL	---	---	Comply	
			PBBs	ND	BL	---	---	Comply	
			PBDEs		BL	---	---	Comply	
			DBP	---	---	---	ND	Comply	
			BBP	---	---	---	ND	Comply	
			DEHP	---	---	---	ND	Comply	
			DIBP	---	---	---	ND	Comply	



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Part No.	Part Description	BOM No.	Restricted Substances	Results of EDXRF ⁽¹⁾	Conclusion of EDXRF ⁽¹⁾	Screening Result of PHTH ⁽²⁾	Result of Wet Chemical Testing ⁽³⁾ (mg/kg)	Conclusion on EU RoHS	Sample Submitted / Resubmitted Date
13	Black fibre sheet	-	Cd	ND	BL	---	---	Comply	14 Aug 2018
			Pb	ND	BL	---	---	Comply	
			Hg	ND	BL	---	---	Comply	
			Cr(VI)	ND	BL	---	---	Comply	
			PBBs	ND	BL	---	---	Comply	
			PBDEs		BL	---	---	Comply	
			DBP	---	---	---	---	---	
			BBP	---	---	---	---	---	
			DEHP	---	---	---	---	---	
			DIBP	---	---	---	---	---	



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Remark

- (1) (a) There are the results on total Br while test items on restricted substances are PBBs and PBDEs.
There is the result on total Cr while test item on restricted substances is Cr(VI).
- (b) Results are obtained by EDXRF for primary screening, and further chemical testing by ICP-OES (for Cd, Pb, Hg), UV-Vis (for Cr(VI)) and GC-MS (for PBBs, PBDEs) is recommended to be performed if the concentration exceeds the below warning value according to IEC62321-3-1:2013 (unit: mg/kg).

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	$BL \leq (300-3\sigma) < X$	--	$BL \leq (250-3\sigma) < X$
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$

- (c) BL = Below Limit, OL = Over Limit, IN = Inconclusive, LOD = Limit of Detection, -- = Not regulated.
- (d) The XRF screening test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.
- (e) Unit and MDL in EDXRF:

Test Item	Pb	Cd	Hg	Cr	Br
Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MDL	100	50	100	100	50

- (2) Screening results of 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).

Compound	Polymer
DBP	$BL \leq 600 < X$
BBP	$BL \leq 600 < X$
DEHP	$BL \leq 600 < X$
DIBP	$BL \leq 600 < X$

- (3) (a) mg/kg = 0.0001%, MDL=Method detection Limit, ND = Not Detected (<MDL), --- = Not conducted, - = Without BOM.

- (b) Unit and MDL in wet chemical test

Test Item	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 0.10µg/cm².



(c) ▼ =Metal sample

- a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 µg/cm².
The sample coating is considered to contain CrVI
- b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 µg/cm²).
The coating is considered a non-CrVI 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

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.

IEC 62321 series is equivalent to EN 62321 series

http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25

(4) Results & Photos of this report refer to verification report CANEC1815325903.



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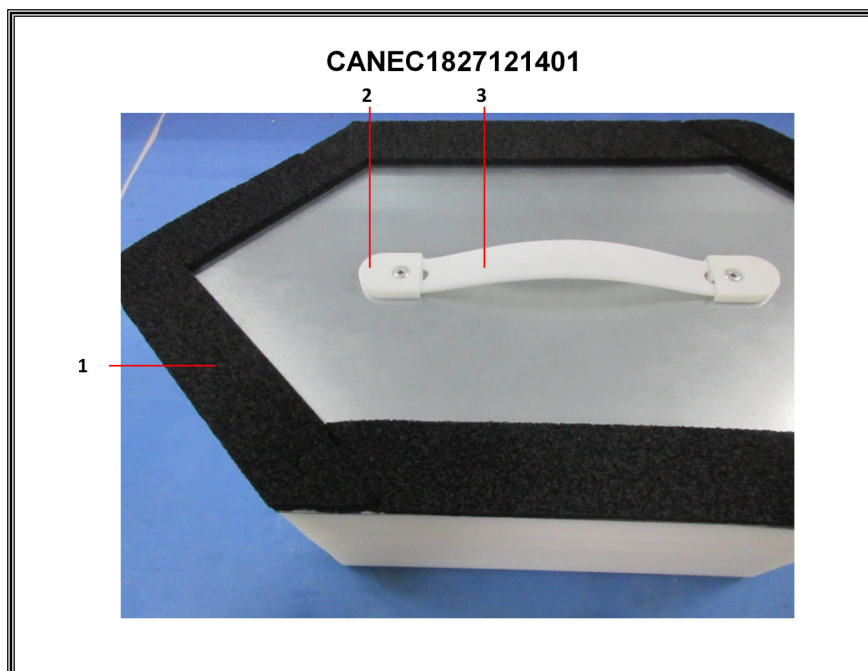
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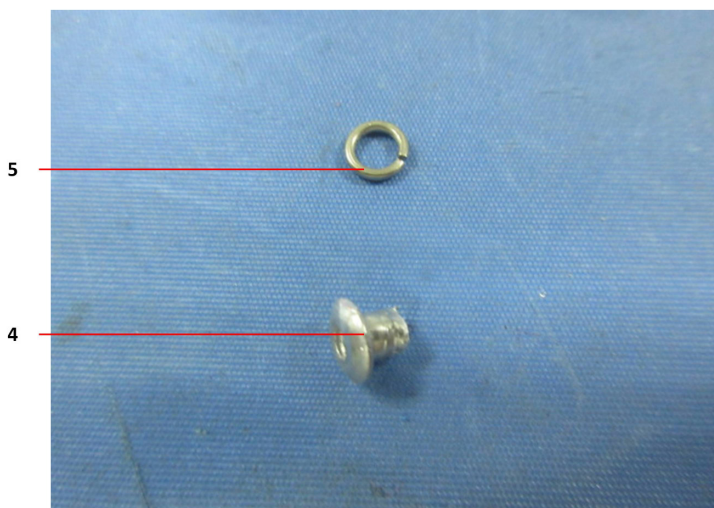
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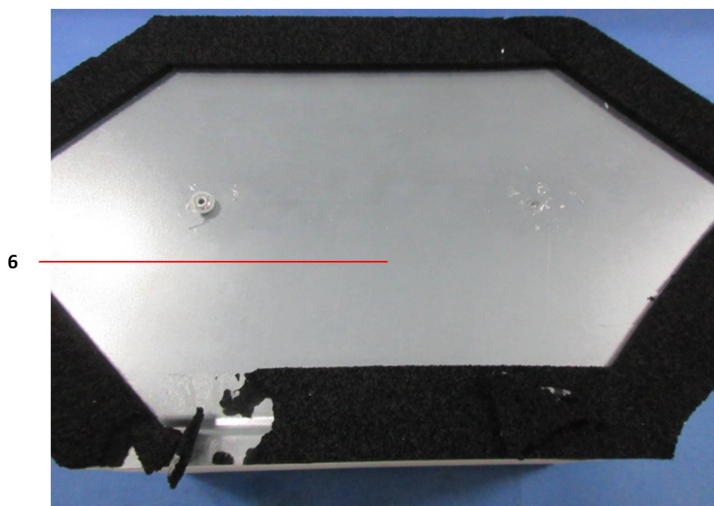
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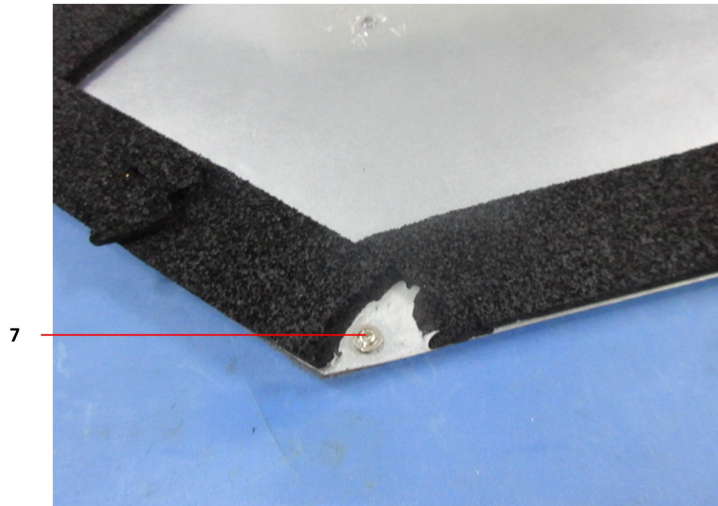
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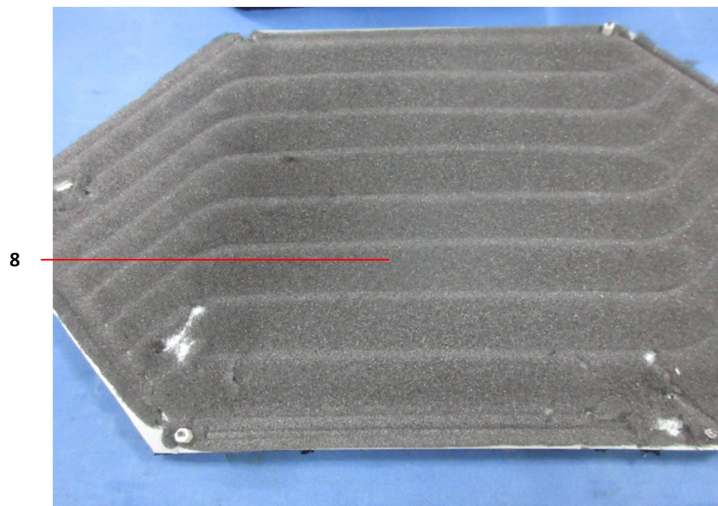
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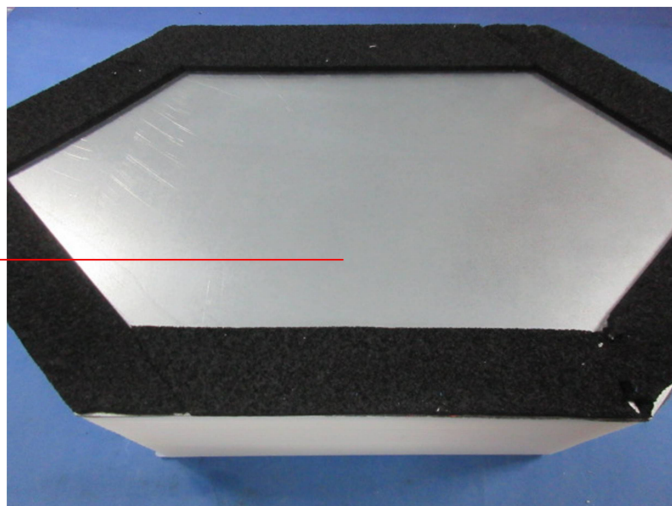
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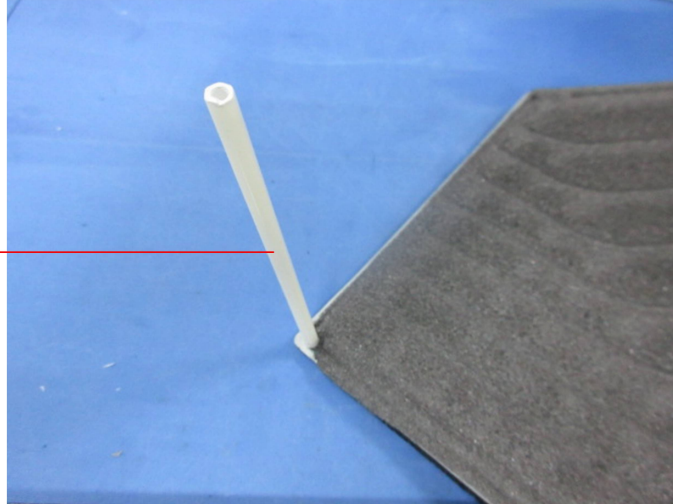


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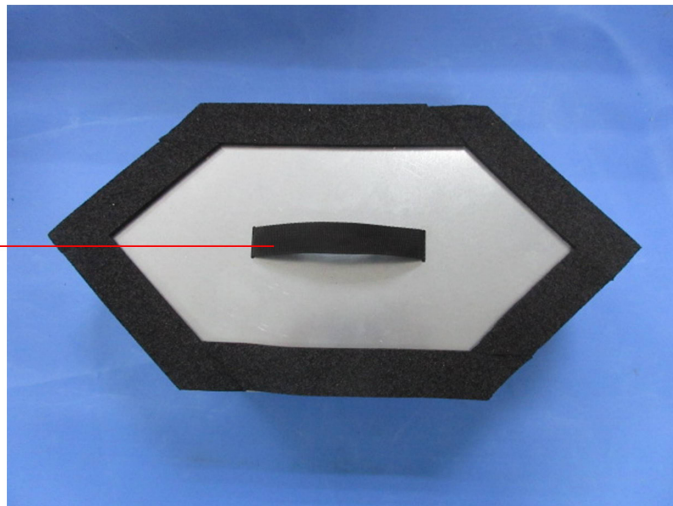
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