

Test Report

Report No. GTS2004290126EN

Job No.:24615

Date: May 15, 2020

Applicant : Guangdong Tumtec Communication Technology Co., Ltd
Address : Rm 302-1, A5 building, Hantian Hi-tech Zone, 17th Shenhai Road, Guicheng Avenue, Nanhai District, Foshan, Guangdong, China
Sample Name : Fiber Optic Fusion Splicer
Tested Model : /
Sample Receiving date: : 2020-04-29
Test period : 2020-04-29 – 2020-05-15
Test Requirement : The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, RoHS Directive 2011/65/EU and its amendment Directive (EU) 2015/863.
Test Method : Please refer to next page(s).
Test result : Please refer to next page(s).
Conclusion : Please refer to next page(s).
Note : The test results are related only to the tested items.

Forward on behalf of

Shanghai Global Testing Services Co., Ltd.

Authorized Signature



Shi Lei/Kevin

General Manger -GTS/SHO



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A. Pb, Cd, Cr(VI), Hg, PBBs&PBDEs

Test Method:

1. Disassembly, disjointment and mechanical sample preparation
 - Ref. to IEC 62321-2: 2013, Disassembly, disjointment and mechanical sample preparation.
2. With reference to IEC 62321-1: 2013, tests were performed for the samples indicated by the photos in this report.
 - (1) Screening – Lead, mercury, cadmium, total chromium and total bromine
 - Ref. to IEC 62321-3-1: 2013, Screening for Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry.
 - (2) Wet chemical test method
 - a. Total Lead, Cadmium, Chromium and Mercury content
 - Ref. to IEC 62321-4: 2013, determination of Mercury in polymers, metals and electronics by ICP-OES.
 - Ref. to IEC 62321-5: 2013, determination of Cadmium, lead and chromium in polymers and electronics and cadmium and lead in metals by ICP-OES.
 - b. Chromium (VI) content
 - For Colourless and coloured corrosion-protected coatings on metals, Ref. to IEC 62321-7-1: 2015, determination of presence of hexavalent chromium (Cr(VI)) in colourless and coloured corrosion-protected coatings on metals by the colorimetric method.
 - For polymers and electronics, Ref. to IEC 62321-7-2: 2017, determination of hexavalent chromium (Cr(VI)) in polymers and electronics by the colorimetric method.
 - c. PBBs, PBDEs
 - Ref. to IEC 62321-6: 2015, determination of polybrominated biphenyls and polybrominated diphenyl ethers in polymers by gas chromatography -mass spectrometry (GC-MS).



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Test result(s):

Part No.	Part Description	Results of EDXRF					Chemical confirmation results (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
1	Fuselage black shell	BL	BL	BL	BL	BL	---	Pass
3	Battery compartments	BL	BL	BL	BL	IN	PBBs:N.D. PBDEs:48	Pass
4	grey and green fuselage	BL	BL	BL	IN	---	CrVI:Negative	Pass
5	chassis	BL	BL	BL	BL	---	---	Pass
6	Machine cover	222 (BL)	BL	BL	IN	---	CrVI:Negative	Pass
7	Screw jacket	BL	BL	BL	IN	---	CrVI:Negative	Pass
8	Black plastic	BL	BL	BL	BL	IN	PBBs:N.D. PBDEs:N.D.	Pass
9	Rubber mat	BL	BL	BL	BL	BL	---	Pass
10	spring	24 (BL)	BL	BL	IN	---	CrVI:Negative	Pass
11	Silver metal bar	38 (BL)	BL	BL	IN	---	CrVI:Negative	Pass
12	metal clip	BL	BL	BL	IN	---	CrVI:Negative	Pass
13	Black plastic	BL	BL	BL	BL	IN	PBBs:N.D. PBDEs:N.D.	Pass
14	Black plastic	BL	BL	BL	BL	IN	PBBs:N.D. PBDEs:N.D.	Pass
15	Transparent plastic	BL	BL	BL	BL	BL	---	Pass
17	Wool hand with	28 (BL)	BL	BL	BL	BL	---	Pass
18	Metal buckle	241 (BL)	BL	BL	BL	---	---	Pass
19	Metal plate	BL	BL	BL	BL	---	---	Pass



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Part No.	Part Description	Results of EDXRF					Chemical confirmation results (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
20	Metal ring	348 (BL)	BL	BL	IN	---	CrVI:Negative	Pass
21	Black box	IN	BL	BL	IN	---	Pb:258 CrVI:Negative	Pass
22	Transparent cover	BL	BL	BL	BL	BL	---	Pass
23	metal plate	112 (BL)	BL	BL	IN	---	CrVI:Negative	Pass
24	chip	BL	BL	BL	BL	BL	---	Pass
25	Conveyor belt	BL	BL	BL	BL	BL	---	Pass
26	With rod screws	99 (BL)	BL	BL	IN	---	CrVI:Negative	Pass
27	Dome screws	BL	BL	BL	BL	---	---	Pass
28	built-in copper sleeve	IN	IN	BL	IN	---	Pb:26979 ^(*) Cd:83 CrVI:Negative	Pass
29	Insert metal	87 (BL)	BL	BL	IN	---	CrVI:Negative	Pass
30	Metal bar	IN	BL	BL	IN	---	Pb:74 CrVI:Negative	Pass
31	Metal post	150 (BL)	BL	BL	IN	---	CrVI:Negative	Pass
32	Screw1	108 (BL)	BL	BL	IN	---	CrVI:Negative	Pass
33	Screw2	BL	BL	BL	IN	---	CrVI:Negative	Pass
34	Screw3	115 (BL)	BL	BL	IN	---	CrVI:Negative	Pass
35	Sheet metal	BL	BL	BL	IN	---	CrVI:Negative	Pass
36	button	BL	BL	BL	BL	BL	---	Pass
37	Beige rubber gasket	BL	BL	BL	BL	BL	---	Pass
38	White bottom	BL	BL	BL	BL	BL	---	Pass
39	Yellow control board	BL	BL	BL	BL	BL	---	Pass

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Floor 2nd, Building D-1, No. 128, Shenfu Road, Minhang District, Shanghai, China.

Tel: (86-21) 3363 7866 Fax: (86-21) 3363 7858 E-mail: info@gts-lab.com Web Site: <http://www.gts-lab.com>



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Part No.	Part Description	Results of EDXRF					Chemical confirmation results (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
40	Trapezoidal plastic	BL	BL	BL	BL	IN	PBBs:N.D. PBDEs:N.D.	Pass
41	Black plastic	BL	BL	BL	BL	IN	PBBs:N.D. PBDEs:N.D.	Pass
42	Button framework	BL	BL	BL	BL	BL	---	Pass
43	black plastic hook	BL	BL	BL	BL	BL	---	Pass
44	Magnetic block	BL	BL	BL	BL	---	---	Pass
45	Black rubber ring	BL	BL	BL	BL	IN	PBBs:N.D. PBDEs:13	Pass

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Remark:

(^1) “---”= Not Applicable;

(^2) (a) It is the result on total Br while test item on restricted substances is PBBs/PBDEs. It is the result on total Cr while test item on restricted substances is Cr(VI).

(b) The XRF screening test for RoHS elements-The reading may be different to the actual content in the sample be of non-uniformity composition.

(c) Results are obtained by EDXRF for primary screening, and further chemical testing by ICP-OES (for Pb, Cd, Hg), UV-VIS for Cr(VI) and GC/MSD (for PBBs/PBDEs) is recommended to be performed if the concentration exceeds the below warning value according to IEC 62321-3-1: 2013.

Attached table 1, XRF screening limits in mg/kg for regulated elements in various matrices:

Element	Polymer Materials	Metallic Materials	Electronics
Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$LOD < X < (250+3\sigma) \leq OL$
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	$BL \leq (300-3\sigma) < X$	N.A.	$BL \leq (250-3\sigma) < X$
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$

Note: ① BL “below limit” = the result less than the limit.

② OL “over limit” = the result greater than the limit.

③ IN = inconclusive, the region where need further chemical testing by ICP-OES (for Pb、Cd、Hg), UV-VIS (for Cr(VI)) and GC/MSD (for PBBs, PBDEs).

④ 3σ = Repeability of the analyser at the action level.

⑤ LOD = Limit of detection.

(^3) (a) mg/kg=ppm=0.0001%;

(b) N.D. = Not detected (lower than RL);

(c) Reporting Limit (RL) and Limit of Directive 2011/65/EU.

Parameter	Unit	Limit	Reporting Limit (RL)
Lead (Pb)	mg/kg	1000	10
Cadmium (Cd)	mg/kg	100	10
Mercury (Hg)	mg/kg	1000	10
Chromium VI (Cr VI)	mg/kg	1000	R1
Group PBBs	mg/kg	1000	R2
Group PBDEs	mg/kg	1000	R2

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R1: Cr(VI) for metal sample, the reporting limit (RL)= Method Detection Limit (MDL)=0.10 ug/cm².

The reporting limit (RL) of Cr(VI) for polymers and electronics is 10mg/kg.

R2: The reporting limit (RL) for single compound of PBBs & PBDEs is 50mg/kg.

(d) According to IEC 62321-7-1: 2015, result on Cr(VI) for metal sample is shown as Negative, Inconclusive or Positive: Negative = Absence of Cr(VI), Inconclusive = Maybe exist Cr(VI), Positive = Presence of Cr(VI).

Colorimetric result (Cr(VI) concentration)	Qualitative result
The sample solution is < the 0.10 ug/cm ² equivalent comparison standard solution	The sample is negative for Cr(VI)–The Cr(VI) concentration is below the limit of quantification. The coating is considered a non-Cr(VI) based coating.
The sample solution is ≥ the 0.10 ug/cm ² and ≤ the 0.13 ug/cm ² equivalent comparison standard solutions	The result is considered to be inconclusive – Unavoidable coating variations may influence the determination. Recommendation: if addition samples are available, perform a total of 3 trials to increase sampling surface area. Use the averaged result of the 3 trials for the final determination.
The sample solution is > the 0.13 ug/cm ² equivalent comparison standard solution	The sample is positive for Cr(VI)–The Cr(VI) concentration is above the limit of quantification and the statistical margin of error. The sample coating is considered to contain Cr(VI)

(^4) Lead (Pb) was exempted by RoHS Directive 2011/65/EU based on Annex III/6(c): Copper alloy containing up to 4% lead by weight.



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B. Phthalates—DBP, BBP, DEHP & DIBP

Test Method: Ref. to IEC 62321-8: 2017

Determination of Phthalates in polymers by Gas Chromatography-Mass Spectrometry (GC-MS)

Test result:

Test item	DBP	BBP	DEHP	DIBP
Maximum Permissible Limit (mg/kg)	1000	1000	1000	1000

Material No.	Test item (mg/kg)			
	DBP	BBP	DEHP	DIBP
1	N.D.	N.D.	N.D.	N.D.
3	N.D.	N.D.	N.D.	N.D.
8	N.D.	N.D.	N.D.	N.D.
9	N.D.	N.D.	N.D.	N.D.
13	N.D.	N.D.	N.D.	N.D.
14	N.D.	N.D.	N.D.	N.D.
15	N.D.	N.D.	N.D.	N.D.
17	N.D.	N.D.	518	N.D.
24	N.D.	N.D.	N.D.	N.D.
25	N.D.	N.D.	N.D.	N.D.
36	N.D.	N.D.	N.D.	N.D.
37	N.D.	N.D.	N.D.	N.D.
38	N.D.	N.D.	N.D.	N.D.
39	N.D.	N.D.	N.D.	N.D.
40	N.D.	N.D.	N.D.	N.D.
41	N.D.	N.D.	N.D.	N.D.
42	N.D.	N.D.	N.D.	N.D.
43	N.D.	N.D.	N.D.	N.D.

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Material No.	Test item (mg/kg)			
	DBP	BBP	DEHP	DIBP
45	N.D.	N.D.	N.D.	N.D.

Remark: 1. Reporting Limit (RL) for BBP, DBP, DEHP, DIBP=50mg/kg.
2. N.D. = Not Detected (<RL).

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Sample photo(s):



Test item: Fiber Optic Fusion Splicer

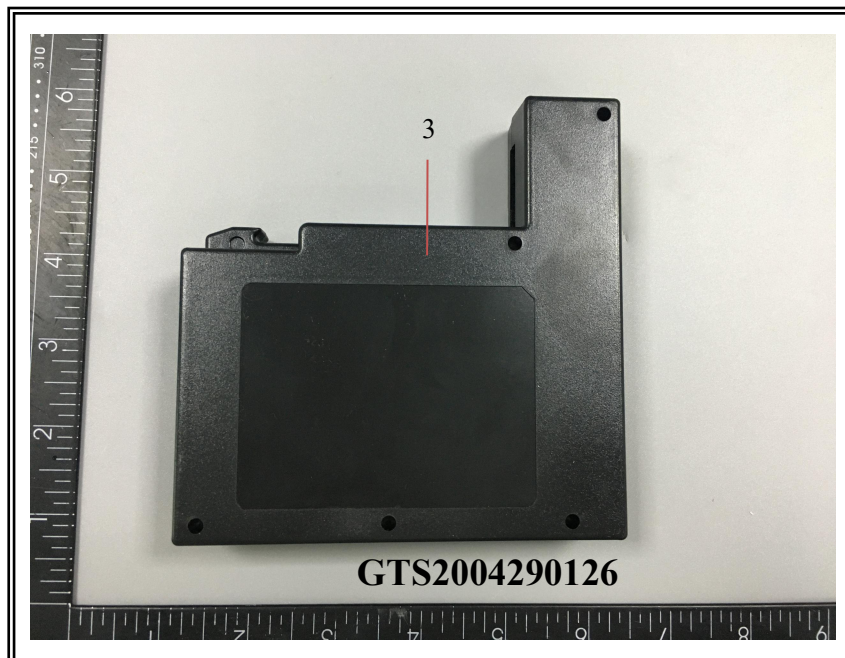
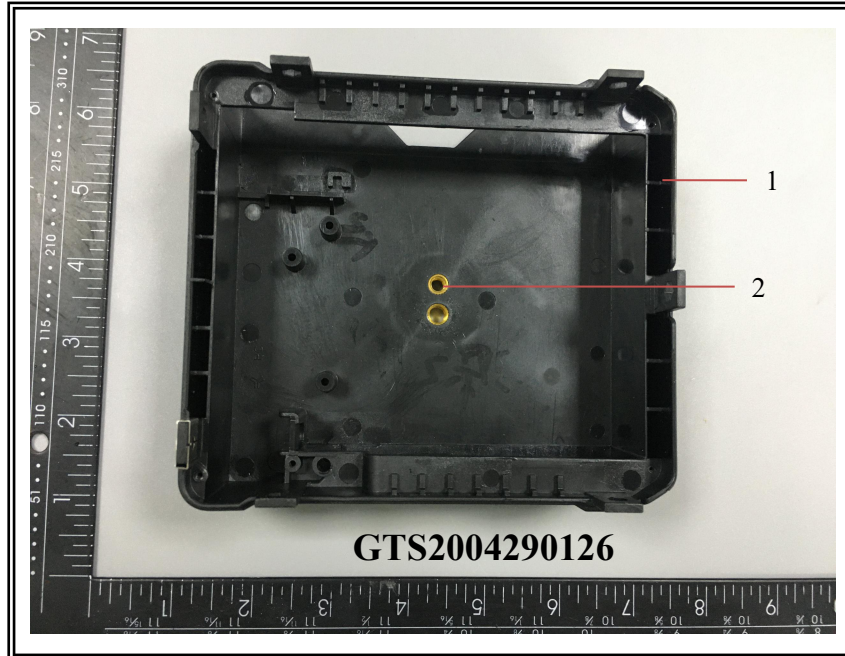
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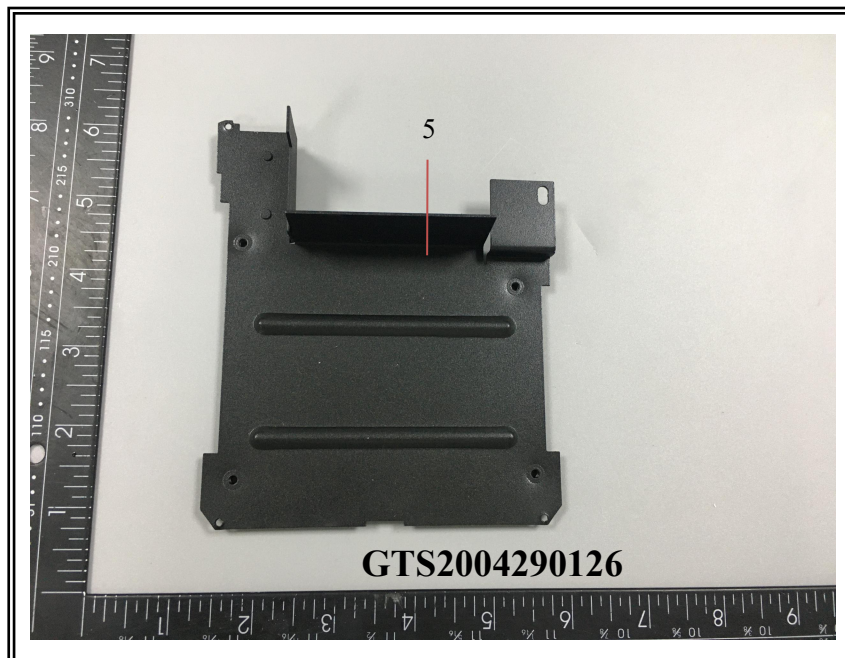
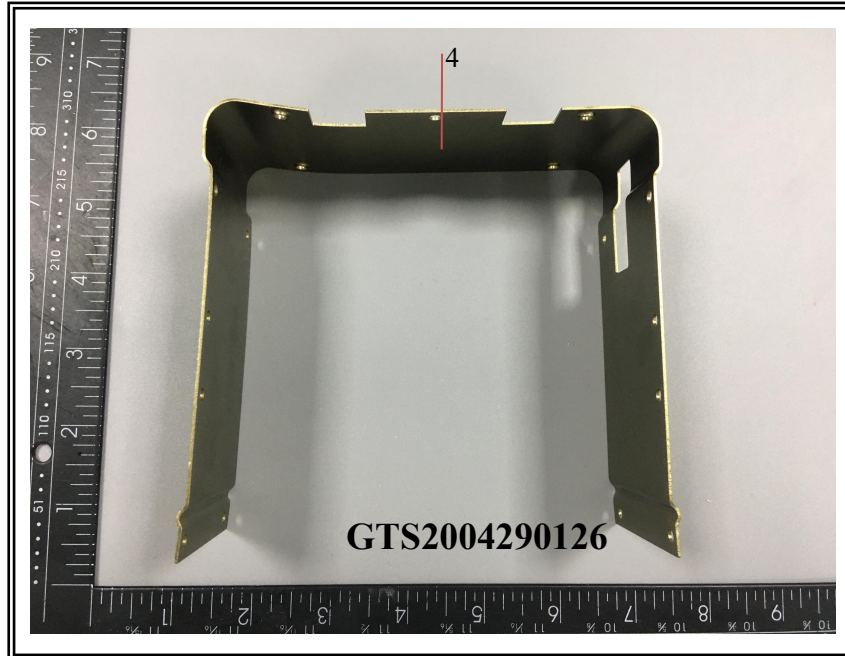


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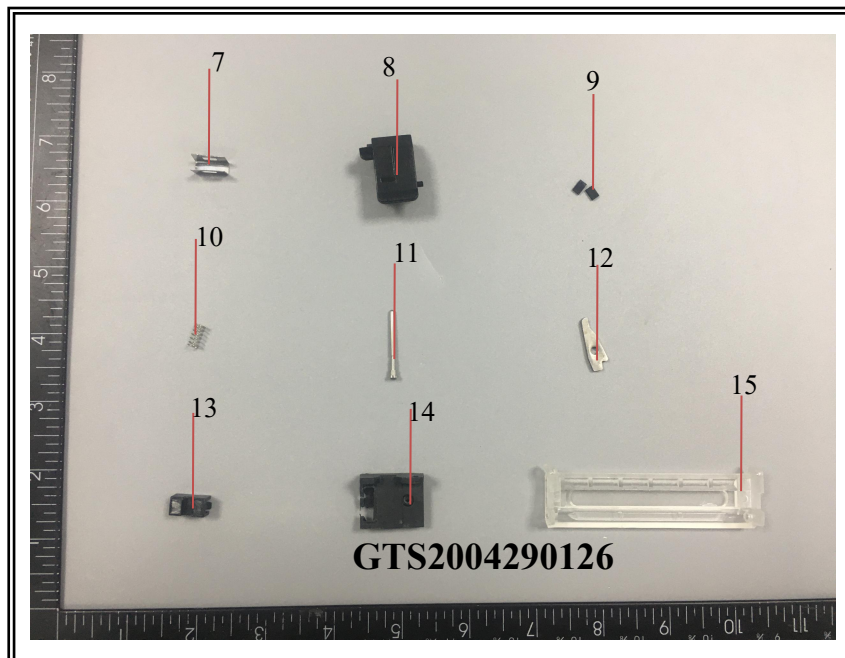
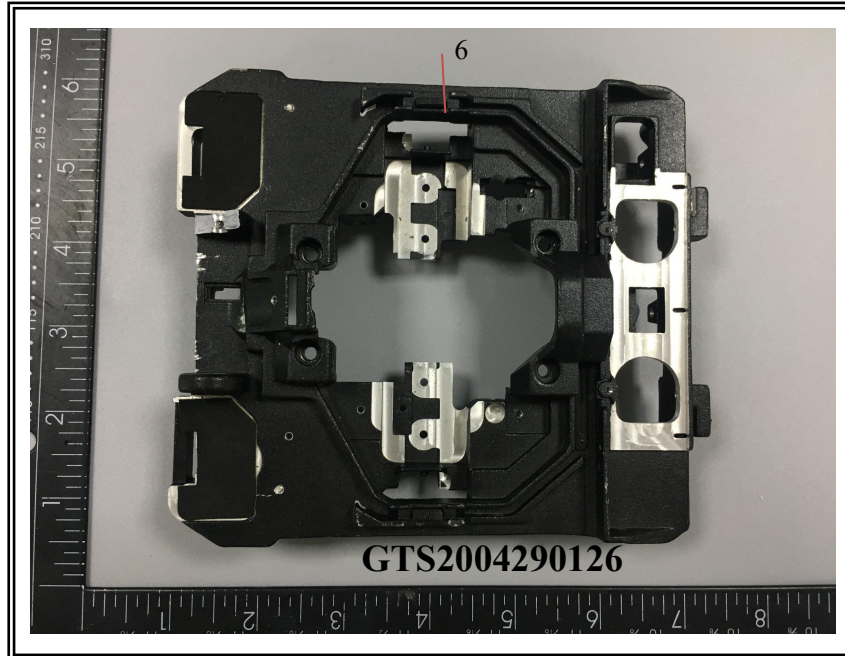


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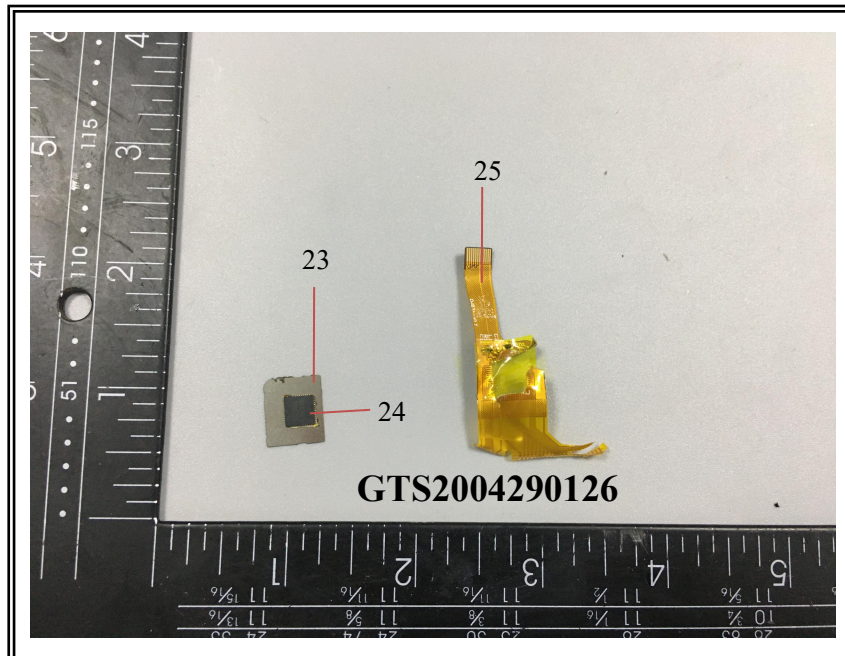


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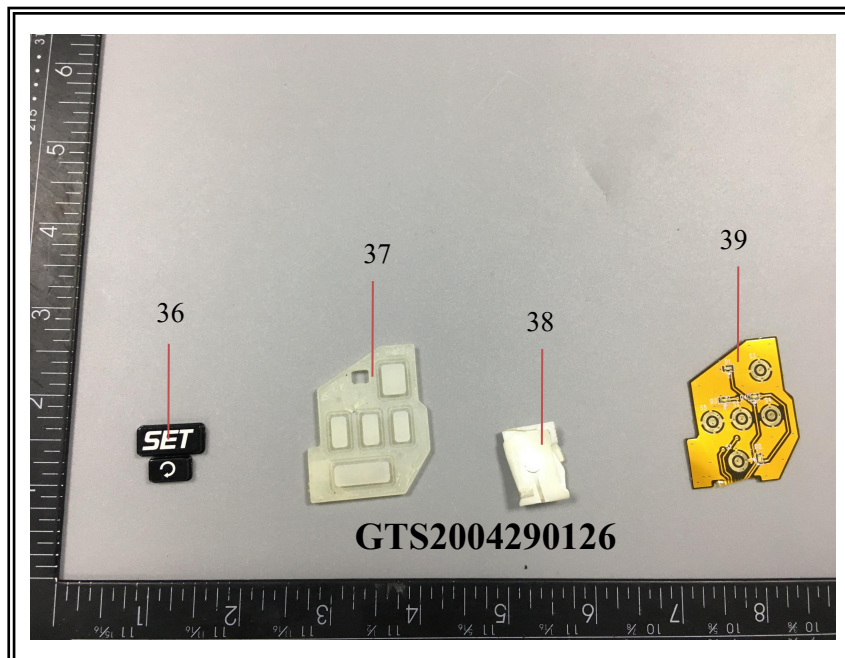


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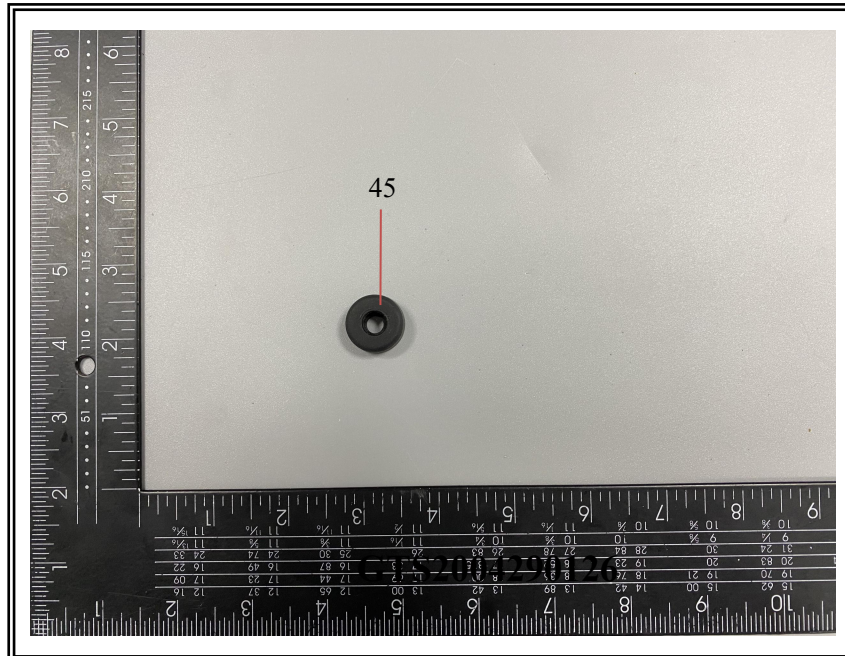
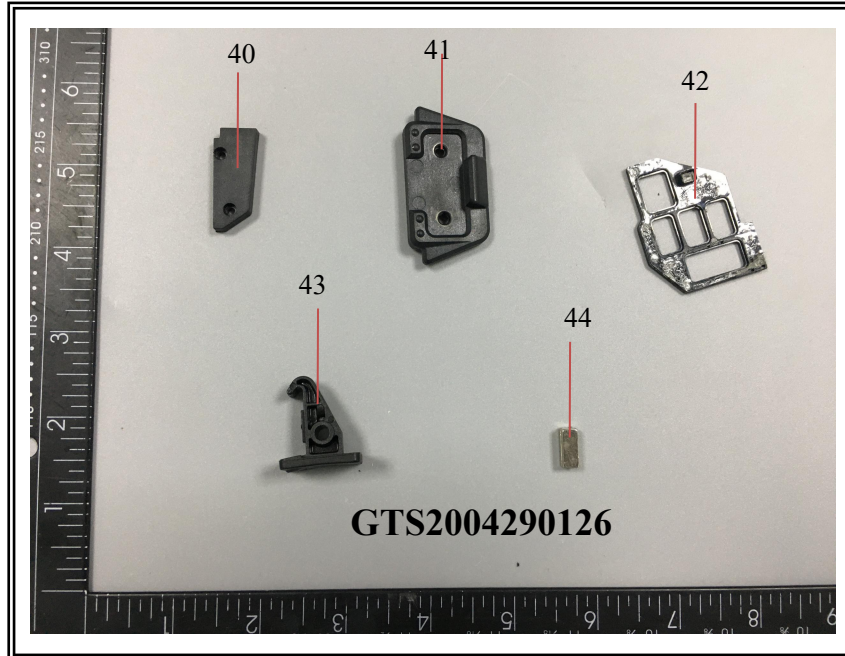


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