

E-Cigarette Aerosol Analysis Report

Report No. : TCT220216C014

Date : Feb. 21, 2022

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Applicant: ShenZhen Jieshibo Technology CO.,Ltd
Address: 3Building, Xianyuxing Industrial Park, Fuhe Road Gonghe Community,
Shajing Street, Baoan District, Shenzhen City, China

The following sample was submitted and identified by/on behalf of the client as:

Sample Name: VPEN Disposable Vape Pen
Model No.: JY1305
Flavour: Strawberry Watermelon
Power level in testing: Voltage/Wattage of tested sample is un-adjustable
Adjustable air inlet or not: No
Trade Mark:



Sample Received Date: 2022.02.16
Testing Period: 2022.02.16—2022.02.21
Test Method: Please refer to the following page(s).
Test Result(s): Please refer to the following page(s).

Test Items	Test Requested
1 Carbonyl Compounds: Formaldehyde, Acetaldehyde, Acrolein, Crotonaldehyde	Emission testing according to Article 20 of Tobacco Product Directive (2014/40/EU)
2 Metals: Aluminum, Chromium, Iron, Nickel, Tin, Lead, Cadmium, Arsenic, Antimony	
3 Nicotine consistency	
4 Diacetyl and Pentane 2,3 dione	
5 Ethylene Glycol and Diethylene Glycol	
6 Specific Nitrosamines: N-nitrosornicotine(NNN), 4-(N-methylnitrosamino)-1-(3-pyridyl)-1-butanone(NNK)	
7 VOC substances: Toluene, Benzene, 1,3-Butadiene, Isoprene	

Checked by

Justin

Approved by

Ryan Zhang
Technical Manager

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Test Results:

Test Condition for test items except Nicotine consistency test:

With reference to the CORESTA RECOMMENDED METHOD N° 81 method parameter, Afnor standardization XP D90-300-3, International Standard ISO 20768:2018 and PD CEN/TR 17236:2018, a smoke machine was used to collect the vapor.

Puff Duration	3.0s±0.1s
Puff Volume	55mL±0.3mL
Puff Frequency	30s±0.5s
Puff of Each Group	20
Group Interval Time	300s±120s
Maximum Flow	18.5mL/s±1.0mL/s
Pressure Drop	< 50hPa
Group	5
Total Number of Puff	100
Total Duration of Vaporization	300s

The temperature and relative humidity of the test atmosphere during machine preparation and testing were kept within the following limits: temperature ±2°C, relative humidity ±5%

Specimen Description:

No.1 VPEN Disposable Vape Pen

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1. Carbonyl Compounds Content(s)

Test method: According to XP D90-300-3:2016, the aerosol generated by the e-cigarette is absorbed by the impactor containing 40mL acidified solution of 2,4-dinitrophenylhydrazine (DNPH) in acetonitrile. The solution was filtered and analyzed by reverse phase high - performance liquid chromatography and determined using a UV detector.

Test Item	CAS No.	Unit	MDL	Content(s)
				No.1
Formaldehyde	50-00-0	µg/100puffs	0.5	ND
Acetaldehyde	75-07-0	µg/100puffs	0.5	4.99
Acrolein	107-02-8	µg/100puffs	0.5	ND
Crotonaldehyde	4170-30-3	µg/100puffs	0.5	ND

- Note:
- µg = Microgram
 - ND = Not Detected (less than MDL)
 - MDL = Method Detection Limit

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2. Metals Content(s)

Test method: According to Afnor XP D90-300-3:2016 Annex A.6, wipe the clamp with isopropyl alcohol. Let stand for a minute. 20 ml of nitric acid was added to the impactor, and placed in series with the Cambridge filter to absorb the aerosol. The Cambridge filter was removed and placed in nitric acid, shaken at 210 rpm for 30 min, and the solution was filtered and analyzed by ICP-MS.

Test Item	CAS No.	Unit	MDL	Content(s)
				No.1
Aluminum(Al)	7429-90-5	µg/100puffs	0.01	ND
Chromium(Cr)	7440-47-3	µg/100puffs	0.01	ND
Iron(Fe)	7439-89-6	µg/100puffs	0.01	ND
Nickel(Ni)	7440-02-0	µg/100puffs	0.01	0.387
Tin(Sn)	7440-31-5	µg/100puffs	0.01	ND
Lead(Pb)	7439-92-1	µg/100puffs	0.01	ND
Cadmium(Cd)	7440-43-9	µg/100puffs	0.01	ND
Arsenic(As)	7440-38-2	µg/100puffs	0.01	ND
Antimony(Sb)	7440-36-0	µg/100puffs	0.01	ND

- Note:
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3. Nicotine Consistency Test

Test Condition: With reference to the CORESTA RECOMMENDED METHOD N° 81 method parameter and Afnor standardization XP D90-300-3, a smoke machine was used to collect the vapor.

Puff Duration	3.0s±0.1s
Puff Volume	55mL±0.3mL
Puff of Each Group	20
Maximum Flow	18.5mL/s±1.0mL/s
Pressure Drop	< 50hPa

The temperature and relative humidity of the test atmosphere during machine preparation and testing were kept within the following limits: temperature $\pm 2^{\circ}\text{C}$, relative humidity $\pm 5\%$

Test method: According to Afnor XP D90-300-3:2016 Annex A.3, wipe the clamp with isopropyl alcohol. Let stand for a minute. The aerosol generated by the e-cigarette is absorbed by the Cambridge filter. Remove the Cambridge filter and place it into a centrifuge tube, add 20 mL of Isopropyl alcohol and 0.2ml Internal standard stock solution. Shaken at 210 rpm for 30 min, and the solution was filtered and analyzed by GC-FID.

Sample No.	Nicotine(CAS No.:54-11-5) Contents(mg/20Puffs)						Total (mg/100puffs)
	Group 1*	Group 2	Group 3*	Group 4	Group 5*	AVG	
No.1	1.87	1.84	1.87	1.86	1.86	1.86	9.31
Deviation (%)	0.4	-	0.7	-	0.2	-	-

- Note:
- mg = milligram
 - ND = Not Detected (less than MDL)
 - MDL = Method Detection Limit = 0.05mg/20Puffs
 - 1group = 20puffs
 - * Values used for determination of consistency of nicotine emission
 - Under the conditions of the test and with reference to AFNOR XP D90-300-3, the electronic cigarette delivers a dose of nicotine at consistent levels.

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4. Diacetyl and Pentane 2,3 dione Content(s)

Test method: According to Afnor XP D90-300-3:2016 Annex A.4, the aerosol generated by the e-cigarette is absorbed by the impactor containing 20mL methanol. The solution was filtered and analyzed by GC-MS.

Test Item	CAS No.	Unit	MDL	Content(s)
				No.1
Diacetyl	431-03-8	µg/100puffs	5.0	ND
Pentane 2,3 dione	600-14-6	µg/100puffs	5.0	ND

- Note:
- µg = Microgram
 - ND = Not Detected (less than MDL)
 - MDL = Method Detection Limit

5. Ethylene Glycol and Diethylene Glycol Content(s)

Test method: According to SOP-CL-090, wipe the clamp with isopropyl alcohol. Let stand for a minute. 20 ml of methanol was added to the impactor and placed in series with the Cambridge filter to absorb the aerosol. The Cambridge filter was removed and placed in methanol, shaken at 210 rpm for 30 min, and the solution was filtered and analyzed by GC-FID.

Test Item	CAS No.	Unit	MDL	Content(s)
				No.1
Ethylene Glycol	107-21-1	µg/100puffs	1.0	ND
Diethylene Glycol	111-46-6	µg/100puffs	1.0	ND

- Note:
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6. Specific Nitrosamines Content(s)

Test method: According to CORESTA Recommended Method No. 75(2019), wipe the clamp with isopropyl alcohol. Let stand for a minute. The aerosol generated by the e-cigarette is absorbed by Cambridge filter, and the Cambridge filter was removed and placed in an Erlenmeyer flask, added to 20 mL of 100 mM ammonium acetate solution, shaken at 210 rpm for 60 min, filtered and analyzed by LC-MS/MS.

Test Item	CAS No.	Unit	MDL	Content(s)
				No.1
N-nitrosornicotine(NNN)	80508-23-2	µg/100puffs	0.2	ND
4-(N-methylnitrosamino)-1-(3-pyridyl)-1-butanone(NNK)	64091-91-4	µg/100puffs	0.2	ND

- Note:
- µg = Microgram
 - ND = Not Detected (less than MDL)
 - MDL = Method Detection Limit

7. VOC substances content(s)

Test method: According to CORESTA Recommended Method No.70 (2019), wipe the clamp with isopropyl alcohol. Let stand for a minute. 20 ml of methanol was added to the impactor and placed in series with the Cambridge filter to absorb the aerosol. The Cambridge filter was removed and placed in methanol, shaken at 210 rpm for 30 min, and the solution was filtered and analyzed by GC-MS.

Test Item	CAS No.	Unit	MDL	Content(s)
				No.1
Toluene	108-88-3	µg/100puffs	2.0	ND
Benzene	71-43-2	µg/100puffs	2.0	ND
1,3-Butadiene	106-99-0	µg/100puffs	2.0	ND
Isoprene	78-79-5	µg/100puffs	2.0	ND

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 - MDL = Method Detection Limit

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Photo(s) of the sample(s)



***** End of Report *****

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