



# Test Report

Report No.: CPC180002-3

Date: Jan.17, 2018

Applicant Name: GD Sigelei Electroinc Tech Co., Ltd  
Applicant Add.: B7 Building, No.1 District, Xicheng Science and Technology Park, Hengli Town, Dongguan, China

Test sample(s) was(were) submitted by the applicant, report on the submitted sample(s) said to be:

Sample Name: Sigelei Top1  
Product Form: Device (body)  
Output power: 10~230 W  
Brand: SIGELEI

Sample Receiving Date: Jan.05, 2018  
Testing Period: Jan.05, 2018 to Jan.17, 2018

Tests conducted: As requested by the applicant, for details refer to attached page(s).

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Test Request:

Test Item	Test Request
Nicotine Consistence, Nicotine, Total Particulate Matter, Carbonyls, Heavy Metal Elements, Flavour Ingredients	Tobacco Product Directive (2014/40/EU )Article 20

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Signed for and on behalf of  
Skyte Testing Services Guangdong Co., Ltd.



David Tu / General Manager

Remark: Please note that every statement made in this report is only valid for the samples tested and reported herein. This report shall not be reproduced except in full, without the written approval of SKYTE. The sample(s)'s information was provided by the applicant, SKYTE has no responsibility for the truth of such information.

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## Analytical Method Parameters

Smoking machine condition: Puffing Frequency: 30s±0.1s  
Puffing Duration: 3s±0.5s  
Puff Volume: 55mL±0.3 mL  
Inhalation Profile : Square Wave  
Inhalation Flow Rate (L/min): 1.10

Device Power Setting: 65W  
Number of puffs per series: 20  
Number of series: 5  
Total number of puffs:100  
Time between 2 series: 300s  
Total vaporization duration:300s

## Test Result

### 1. Nicotine Consistence

Test Item	CAS No.	Test Result (mg/100 puffs)			AVG (mg/100 puffs)	Target values*
		1~20 puffs	41~60 puffs	81~100 puffs		
Nicotine Consistence	54-11-5	16.4	16.5	17.4	16.8	25%
Deviation	—	-2.38%	-1.79%	3.57%	—	

### 2. Nicotine

Test Item	CAS No.	Test Result (mg/100 puffs)	MDL (mg/100 puffs)
Nicotine	54-11-5	16.8	0.05

### 3. Total Particulate Matter

Test Item	Test Result (g/200 puffs)
Total Particulate Matter	3.16

### 4. Carbonyls

Test Item	CAS No.	Test Result (µg/200 puffs)	MDL (µg/200 puffs)	Target values* (µg/200 puffs)
Formaldehyde	50-00-0	38.2	4.0	200
Acetaldehyde	75-07-0	22.2	4.0	3200
Acrolein	107-02-8	N.D.	4.0	16

Test Item	CAS No.	Test Result ( $\mu\text{g}/200$ puffs)	MDL ( $\mu\text{g}/200$ puffs)	Target values* ( $\mu\text{g}/200$ puffs)
Crotonaldehyde	123-73-9	N.D.	4.0	—
Butyraldehyde	123-72-8	N.D.	4.0	—
Propionaldehyde	123-38-6	N.D.	4.0	—
Methyl ethyl ketone	78-93-3	N.D.	4.0	—
Acetone	67-64-1	N.D.	4.0	—

## 5. Heavy Metal Elements

Test Item	CAS No.	Test Result ( $\mu\text{g}/200$ puffs)	MDL ( $\mu\text{g}/200$ puffs)	Target values* ( $\mu\text{g}/200$ puffs)
Chromium (Cr)	7440-47-3	N.D.	0.3	3
Cadmium (Cd)	7440-43-9	N.D.	0.2	2
Lead (Pb)	7439-92-1	N.D.	0.5	5
Antimony (Sb)	7440-36-0	N.D.	2.0	20
Nickel (Ni)	7440-02-0	N.D.	0.5	5
Arsenic (As)	7440-38-2	N.D.	0.2	2
Aluminum (Al)	7429-90-5	N.D.	0.5	—
Iron (Fe)	7439-89-6	N.D.	0.5	—
Tin (Sn)	7440-31-5	N.D.	0.5	—
Cuprum (Cu)	7440-50-8	N.D.	0.5	—
Mercury (Hg)	7439-97-6	N.D.	0.5	—
Molybdenum (Mo)	7439-98-7	N.D.	0.5	—
Cobalt (Co)	7440-48-4	N.D.	0.5	—
Vanadium (V)	7440-62-2	N.D.	0.5	—
Silicon (Si)	7440-21-3	N.D.	0.5	—

## 6. Flavour Ingredients

Test Item	CAS No.	Test Result ( $\mu\text{g}/200$ puffs)	MDL ( $\mu\text{g}/200$ puffs)	Target values* ( $\mu\text{g}/200$ puffs)
Diacetyl	431-03-8	N.D.	8.0	490
2,3- Pentanedione	600-14-6	N.D.	8.0	—

Tested by: Gaoxinyu, Wenxiaowen, Xiebaoliang, Zhuhonghui

Checked by: Hederuo, Chenyumei

**Remark:**

- (1) N.D. = not detected, less than MDL
- (2) MDL = method detection limit
- (3) mg/100 puffs = milligrams per one hundred puffs.
- (4) µg/200 puffs = micrograms per two hundred puffs.
- (5) g/200 puffs = grams per two hundred puffs.
- (6) \* = The target value is quoted from AFNOR XP D90-300-3
- (7) E-liquid A used for Nicotine test, E-liquid B used for other items test. E-liquid A and B were Prepared According to XP D90-300-3

**Test Method**

Test Item	Method reference	Reference Title	Test Instrument
Definitions And Standard Conditions	CORESTA RECOMMENDED METHOD N° 81	Routine Analytical Machine For E-Cigarette Aerosol Generation And Collection- Definitions And Standard Conditions (June 2015)	---
Nicotine Consistence	AFNOR XP D90-300-3 Annex A.3	Example of method for measuring nicotine in the emissions	GC-FID
Nicotine			
Total Particulate Matter			
Formaldehyde	AFNOR XP D90-300-3 Annex A.5	Example of method for measuring formaldehyde and other aldehydes in the emissions	HPLC
Acetaldehyde			
Acrolein			
Crotonaldehyde			
Butyraldehyde			
Propionaldehyde			
Methyl ethyl ketone			
Acetone			
Chromium (Cr)	AFNOR XP D90-300-3 Annex A.6	Example of method for measuring metals and other non-metal elements in the emissions	ICP-OES
Cadmium (Cd)			
Lead (Pb)			
Antimony (Sb)			
Nickel (Ni)			

Test Item	Method reference	Reference Title	Test Instrument
Arsenic (As)	AFNOR XP D90-300-3 Annex A.6	Example of method for measuring metals and other non-metal elements in the emissions	ICP-OES
Aluminum (Al)			
Iron (Fe)			
Tin (Sn)			
Cuprum (Cu)			
Mercury (Hg)			
Molybdenum (Mo)			
Cobalt (Co)			
Vanadium (V)			
Silicon (Si)			
Diacetyl	AFNOR XP D90-300-3 Annex A.4	Example of method for measuring diacetyl in the emissions	GC-MS
2,3- Pentanedione			

## Overview (Emissions – The Determination Of Carbonyl Compounds In Aerosol)

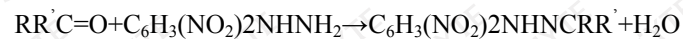
During the vapourisation process, the e-liquid is heated to temperatures often exceeding 300°C. These temperatures are sufficiently high to induce physical change of e-liquids and chemical reactions between the constituents of e-liquids. Solvents contained in the nicotine formulation may undergo pyrolysis leading to formation of potentially toxic compounds.

Both glycerol and propylene glycol have been shown to thermally decompose at high temperatures generating low molecular weight carbonyl compounds with established toxic properties (e.g., formaldehyde, acetaldehyde and acrolein). The operating conditions of the e-cigarette device plays a pivotal role in determining the rate at which carbonyl compounds during e-cigarette use. In addition, it is also known that the higher the propylene glycol content in the e-liquid, the greater the chance that higher levels of carbonyls will be detected in the vapour.

The method is designed to generate a known amount of aerosol under controlled sampling conditions from a specified/ e-cigarette combination, which is then captured in a derivatisation solution. (Derivatisation is a procedural technique that is required to modify the carbonyl compounds functionality in order to enable chromatographic separation and detection). The resulting liquid samples are stabilized and then analysed using high performance liquid chromatography (HPLC).

## Method Principles

The materials (e-cigarette devices or e-liquid) under test will be operated under controlled environmental conditions using an automated vaping machine. 100 inhalations from each sample will be generated. The aerosol generated will be collected into an acidified derivatisation solution containing 2,4-dinitrophenylhydrazine. This solution efficiently traps the aerosol and simultaneously converts the carbonyl compounds into a hydrazone species according to the following equation:



## Sample Photo



**JC-CPC180002-3**

(End of report)

Attention is drawn to the terms and conditions printed overleaf