

TEST REPORT

No. CRSSA/191126952-CA26301

REPORTED DATE: 06/12/2019

Job Ref. CRS/2019-11-19-017


WINTECH METAL PROCESSING SDN BHD180, JALAN 5, KOMPLEKS PERABOT OLAK
LEMPIT 42700, BANTING, SELANGOR.


The following sample(s) was/were submitted and identified by/on behalf of applicant as:

Sample Description : S Pod
Sample Received : 19/11/2019
Testing Period : 19/11/2019 to 06/12/2019

Test Requested : Selected test(s) as requested by customer
Test Method : -PLEASE REFER TO NEXT PAGE(S)-
Test Results : -PLEASE REFER TO NEXT PAGE(S)-

SIGNED FOR AND ON BEHALF OF
SGS (MALAYSIA) SDN BHD


CHEE TUCK CHOON
SECTION HEAD
IKM NO. M/3983/6401/12/14



Test Report Form No.: SGS/TR/CRS/005, Ver: 2.0, Effective Date: 10/05/2019

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Test results :


Test Part Description :

Sample Description: -PLEASE REFER TO PAGE 1-

Table 1: Product Information

Product type	Office Furniture
Product Name	S booth
Sample received on	15 th Nov 2019
Packaging and delivery	Wrapped in paper wrapping and carried by client company owned transport.
Assembly of the booth	Install in SGS Shah Alam Seksyen 22, Lot 4 Ground Floor Address: Lot 4, Persiaran Jubli Perak, Shah Alam Seksyen 22, 40430 Shah Alam
Measurement started date	30 th Nov 2019
Conditioning prior to measurements	Temperature: 23±2°C Relative Humidity: 50±5% RH Measurement of temperature and relative humidity was carried out with calibrated data logger (SA/DL/041) Calibrated date:3-Sep-2019 Calibrated due on : 3-Sep-2020 Calibrated by : VNA Engineering Sdn Bhd
Emission measurement	2 nd Dec 2019
Test Method for emission measurement	Total Volatile Organic Compounds (TVOC as toluene equivalent): Performed according to ISO 16000-6 Formaldehyde: Performed according to ISO 16000-3 Both sampling was performed at 0.97 m height at 0.35 m distance from the booth

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Test Part Description :

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Table 2: Condition during measurements


	Volume	Air Exchange	Temperature	Relative Humidity	Surface area	Air exchange/surface area
Test Room	-	-	23±2°C	50±5% RH	*10.68m ² (exterior surface)	-
Interior of test booth	*1.456m ³	*1.5m ³ /min (~1 air change per minute)	23±2°C	50±5% RH	*8.296m ² (Interior surface)	*10.849m ³ /(m ² .h)

Note: * the measurement was calculated based on the declared information provided by client

Table 3: Test information

Test Parameter	Method	Adsorbent/Absorbent/Trapping material	Sampling volume	Analysis method	Lowest detection limit
Total Volatile Organic Compounds (as toluene equivalent)	ISO 16000-6	Stainless steel tubes packed with Tenax TA/ Carbograph 1TD /Carboxen 1003 (Universal Air Tubes)	4L	Individual compound elute in retention time window between hexane and hexadecane is being summed and quantified as toluene equivalent with GC-MS	2µg/m ³
Formaldehyde	In-house method with reference to ASTM D6007	Sodium bisulfide	30L	Spectrophotometric analysis with chromotropic acid method	0.005 mg/m ³

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The measurements were done as following plan:

1. Measurement of background in test environment and measurement of emission in S pod
 - a. Sampling were performed after 2 days continuous operation

The total amount of Volatile Organic Compounds (TVOC) was determined as sum of volatile organic compounds (VOCs), sampled on Tenax TA® and followed by subsequent desorption by means of Thermal desorption followed by Gas Chromatography Mass Spectrometry (GC-MS) detection. VOCs which elute between and including n-hexane and n-hexadecane on a non-polar capillary column are quantified by converting the total area of chromatogram in the analytical window to a nominal mass by using chromatographic response factor to toluene (Toluene equivalent).

Single VOC was identified by NIST Library matching and substance with quality >90 is then quantified as toluene equivalent. Identifications of the VOC are not confirmed by pure standard comparison. The lowest detection limit for single VOC is at level of $1\mu\text{g}/\text{m}^3$. Only VOC present with concentration $> 2\mu\text{g}/\text{m}^3$ is taken into consideration of calculation of TVOC as indicated in ISO 16000-6

During formaldehyde determination, air is bubble through a single impringer containing 20mL of 1% sodium bisulfite solution at airflow of 1 ± 0.05 L/min for 30min. Following air sampling, the quantity of formaldehyde in the air sampled is determined by chromotropic acid reaction. Chromotropic acid-formaldehyde reaction in strong acidic media follow by measurement of absorbance at 580nm with UV-Vis Spectrophotometer

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Test result:

Table 4 Concentration of single VOC compound as toluene equivalent in range of C₆-C₁₆ with concentration >0.002 mg/m³

Retention time, min	Compound	CAS No.	Concentration after 2 days operation, mg/m ³
-	-	-	<0.002
Sum of VOC (TVOC as toluene equivalent), mg/m ³			<0.002


Table 5: Measurement results as concentration for S Pod (interior volume of 8.296m²)

	TVOC as toluene equivalent	Formaldehyde
	mg/m ³	mg/m ³
S Pod	<0.002	<0.005

Table 6: Measurement result of emission measurements as concentration in test room air

	TVOC as toluene equivalent	Formaldehyde
	mg/m ³	mg/m ³
Test Room	<0.002	<0.005

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Appendix:

Figure 1: GCMS Chromatogram in test room

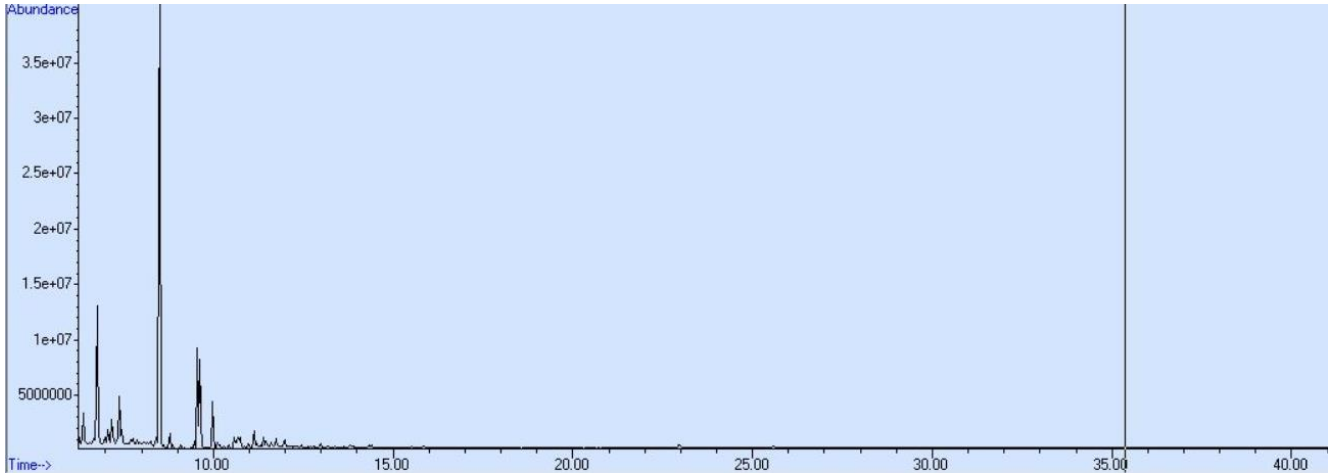
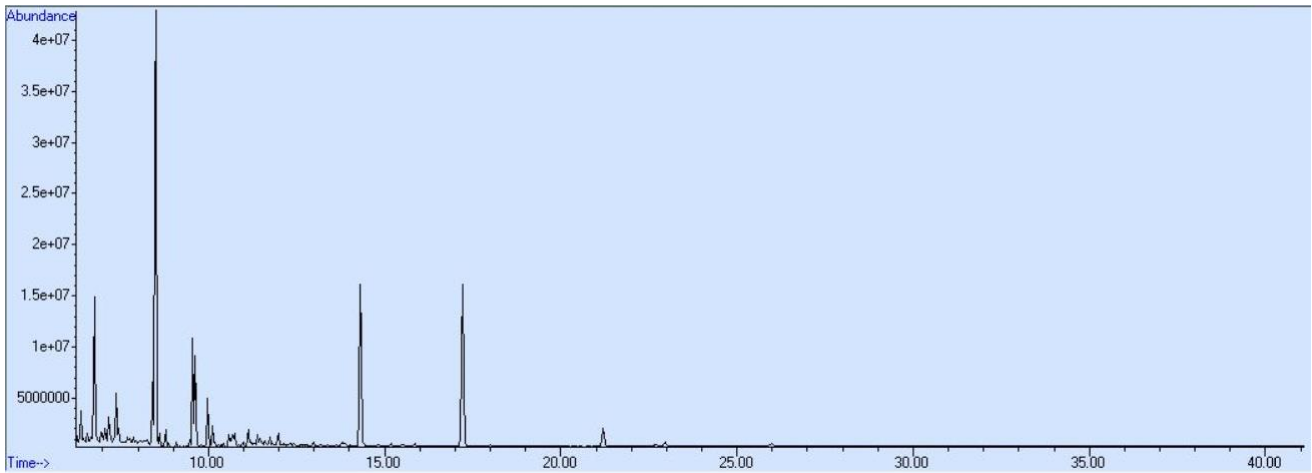


Figure 2: GCMS Chromatogram for S booth



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