

# **Appendix C**

## **Calibration Certificates of Monitoring Equipment**



## Enovative Environmental Service Limited

### REPORT OF EQUIPMENT CALIBRATION

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#### INSTRUMENT DESCRIPTION

*It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler and the filter paper is weighted by HOKLAS laboratory.*

*Instrument: Handheld TSP meter  
Brand Name: TSI  
Model No.: AM520  
Serial No.: 5201735006  
Date of Calibration: 01 August, 2019  
Date of Next Calibration : 01 August, 2020*

#### ISSUING ORGANISATION

##### **Address**

*Enovative Environmental Service Limited  
Flat 23, 6/F, Block C, Goldfield Industrial Centre  
1 Sui Wo Road  
Shatin, N.T.  
Hong Kong*

**Phone:** 852-2242 1020  
**Fax:** 852-3691 9240  
**Email:** [info@eno.com.hk](mailto:info@eno.com.hk)



*Thomas*

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*Mr Wong Siu Ho, Thomas  
Manager*

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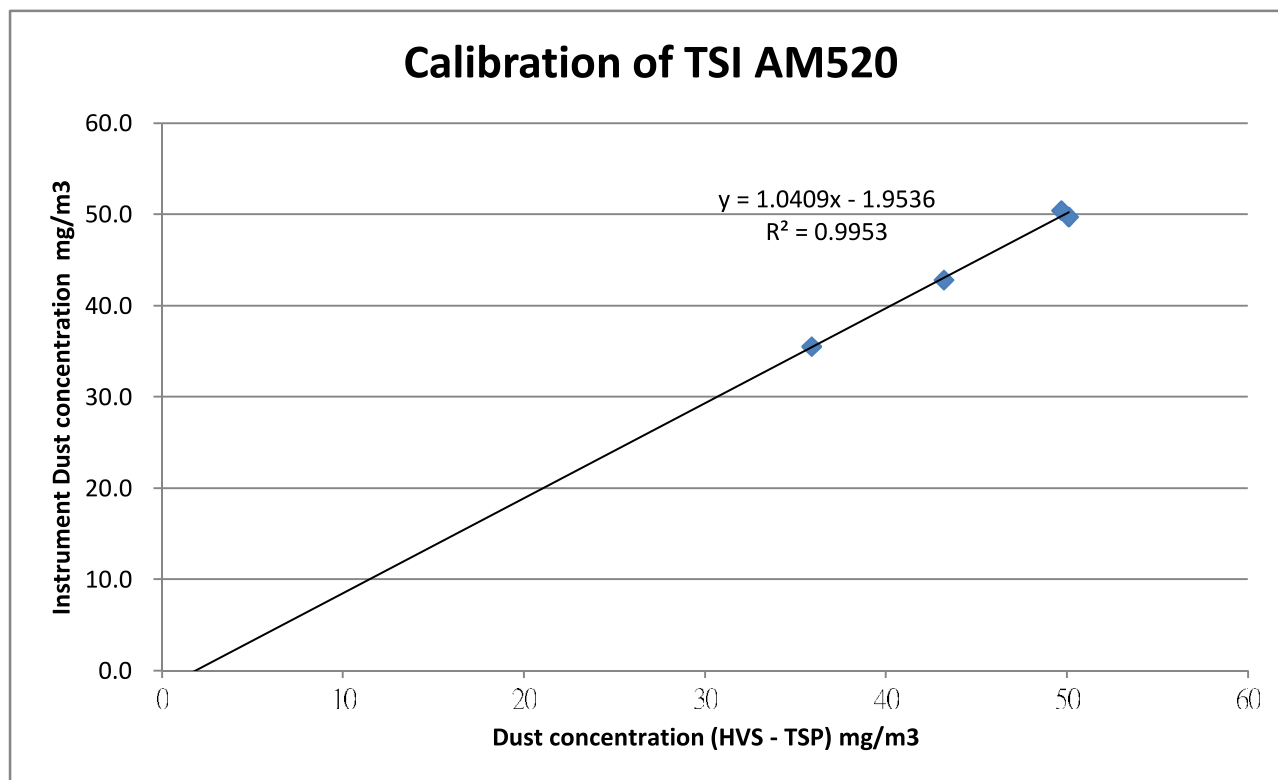


## Enovative Environmental Service Limited

Brand Name: TSI  
Model No.: AM520  
Serial No.: 5201735006  
HVS No.: A12-TSP-102  
HVS Calibration Kit No.: Tisch 1612  
Date of Calibration: 01 August, 2019  
Date of next Calibration: 01 August, 2020

### Calibration Record

HVS - TSP mg/m <sup>3</sup>	35.9	43.2	50.1	49.7
TSI AM520	35.5	42.8	49.7	50.4



\*\*\* Filter paper being used in the calibration :

203475, 203476, 206020, 206603

Those filter papers are weighted by HOKLAS laboratory (ALS Technichem (HK) Pty Ltd.)



*Thomas*

Mr Wong Siu Ho, Thomas  
Manager

# Calibration Certificate

Certificate No. **903414**

Page 1 of 2 Pages

**Customer :** Enovative Environmental Service Limited

**Address :** Flat 6, 3/F, Block E, Wah Lok Industrial Centre, 31-35 Shan Mei Street, Shatin, N.T., Hong Kong.

**Order No. :** Q91328

**Date of receipt :** 4-Apr-19

## Item Tested

**Description :** Sound Level Calibrator

**Manufacturer :** Rion

**I.D. :** 217656

**Model :** NC-74

**Serial No. :** 34678506

## Test Conditions

**Date of Test :** 11-Apr-19

**Supply Voltage :** --

**Ambient Temperature :**  $(23 \pm 3)^{\circ}\text{C}$

**Relative Humidity :**  $(50 \pm 25) \%$

## Test Specifications

Calibration check.

Ref. Document/Procedure : F21, Z02.

## Test Results

All results were within the IEC 60942 Class 1 specifications.

The results are shown in the attached page(s).

Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S014	Spectrum Analyzer	805025	NIM-PRC & SCL-HKSAR
S240	Sound Level Calibrator	803357	NIM-PRC & SCL-HKSAR
S041	Universal Counter	902477	SCL-HKSAR
S206	Sound Level Meter	805027	SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI), or by reference to a natural constant.

The test results apply to the above Unit-Under-Test only

**Calibrated by :**   
Elva Chong

**Approved by :**   
Kin Wong

This Certificate is issued by:

Hong Kong Calibration Ltd.

Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.

Tel: 2425 8801 Fax: 2425 8646

**Date:** 11-Apr-19



# Calibration Certificate

Certificate No. 903414

Page 2 of 2 Pages

Results :

## 1. Generated Sound Pressure Level

UUT Nominal Value (dB)	Measured Value (dB)	IEC 60942 Class 1 Spec.
94.0	94.1	$\pm 0.4$ dB

Uncertainty :  $\pm 0.2$  dB

2. **Short-term Level Fluctuation** : 0.0 dB  
IEC 60942 Class 1 Spec. :  $\pm 0.1$  dB  
Uncertainty :  $\pm 0.01$  dB

## 3. Frequency

UUT Nominal Value (kHz)	Measured Value (kHz)	IEC 60942 Class 1 Spec.
1	1.001	$\pm 1$ %

Uncertainty :  $\pm 3.6 \times 10^{-6}$

4. **Total Distortion** :  $< 1.1$  %  
IEC 60942 Class 1 Spec. :  $< 4$  %  
Uncertainty :  $\pm 2.3$  % of reading

Remark : 1. UUT : Unit-Under-Test  
2. The uncertainty claimed is for a confidence probability of not less than 95%.  
3. Atmospheric Pressure : 996 hPa.

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# Calibration Certificate

Certificate No. **903412**

Page 1 of 3 Pages

**Customer :** Enovative Environmental Service Limited

**Address :** Flat 6, 3/F, Block E, Wah Lok Industrial Centre, 31-35 Shan Mei Street, Shatin, N.T., Hong Kong.

**Order No. :** Q91328

**Date of receipt :** 4-Apr-19

## Item Tested

**Description :** Sound Level Meter

**Manufacturer :** Rion

**I.D. :** 217524

**Model :** NL-52

**Serial No. :** 00175560

## Test Conditions

**Date of Test :** 11-Apr-19

**Supply Voltage :** --

**Ambient Temperature :**  $(23 \pm 3)^{\circ}\text{C}$

**Relative Humidity :**  $(50 \pm 25) \%$

## Test Specifications

Calibration check.

Ref. Document/Procedure: Z01, IEC 61672.

## Test Results

All results were within the IEC 61672 Type 1 or manufacturer's specification.

The results are shown in the attached page(s).

Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S017	Multi-Function Generator	C190926	SCL-HKSAR
S240	Sound Level Calibrator	803357	NIM-PRC & SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI), or by reference to a natural constant.  
The test results apply to the above Unit-Under-Test only

**Calibrated by :**   
Elva Chong

**Approved by :**   
Kin Wong

**Date:** 11-Apr-19

This Certificate is issued by:  
Hong Kong Calibration Ltd.  
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.  
Tel: 2425 8801 Fax: 2425 8646

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# Calibration Certificate

Certificate No. 903412

Page 2 of 3 Pages

Results :

## Acoustical signal test

1. Self-generated noise: 16.2 dBA (Mfr's Spec  $\leq 17$  dBA )

## 2. Reference Sound Pressure Level

UUT Setting				Applied Value (dB)	UUT Reading (dB)
Range (dB)	Frequency Weighting	Time Weighting	Octave Filter		
20 ~ 130	A	F	OFF	94.0	94.1
		S	OFF		94.1
	C	F	OFF		94.1
	Z	F	OFF		94.2
	A	F	OFF	114.0	114.1
		S	OFF		114.1
	C	F	OFF		114.1
	Z	F	OFF		114.2

IEC 61672 Type 1 Spec. :  $\pm 1.1$  dB

Uncertainty :  $\pm 0.1$  dB

## Electrical signal tests

### 3. Electrical signal tests of frequency weightings (A weighting)

Frequency	Attenuation (dB)	IEC 61672 Type 1 Spec.
31.5 Hz	-39.6	- 39.4 dB, $\pm 2$ dB
63 Hz	-26.1	- 26.2 dB, $\pm 1.5$ dB
125 Hz	-16.1	- 16.1 dB, $\pm 1.5$ dB
250 Hz	-8.6	- 8.6 dB, $\pm 1$ dB
500 Hz	-3.2	- 3.2 dB, $\pm 1.4$ dB
1 kHz	0.0 (Ref)	0 dB, $\pm 1.1$ dB
2 kHz	+1.1	+ 1.2 dB, $\pm 1.6$ dB
4 kHz	+0.7	+ 1.0 dB, $\pm 1.6$ dB
8 kHz	-1.1	- 1.1 dB, + 2.1 dB ~ -3.1 dB
16 kHz	-8.5	- 6.6 dB, + 3.5 dB ~ - 17.0 dB

Uncertainty :  $\pm 0.1$  dB



# Calibration Certificate

Certificate No. 903412

Page 3 of 3 Pages

## 4. Frequency & Time weightings at 1 kHz

### 4.1 Frequency Weighting (Fast)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
A	94.0	94.0 (Ref.)	- -	± 0.4 dB
C	94.0	94.0	0.0	
Z	94.0	94.0	0.0	

### 4.2 Time Weighting (A-weighted)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
Fast	94.0	94.0 (Ref.)	- -	± 0.3 dB
Slow	94.0	94.0	0.0	
Time-averaging	94.0	94.0	0.0	

Uncertainty : ± 0.1 dB

Remarks : 1. UUT : Unit-Under-Test

2. The uncertainty claimed is for a confidence probability of not less than 95%.

3. Atmospheric Pressure : 996 hPa.

4. Preamplifier model : NH-25 , S/N : 65662

5. Firmware Version: 1.8

6. Power Supply Check: OK

7. The UUT was adjusted with the supplied sound calibrator at the reference sound pressure level before the calibration.

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