

## **Appendix D. Calibration Certificates**



## CERTIFICATE OF CALIBRATION

Certificate No.: 25CA0530 01

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## Item tested

Description: Acoustical Calibrator (Class 1)  
Manufacturer: CASELLA  
Type/Model No.: CEL-120/1  
Serial/Equipment No.: 2383737  
Adaptors used: -

## Item submitted by

Customer: Mott Macdonald Hong Kong Ltd  
Address of Customer: -  
Request No.: -  
Date of receipt: 30-May-2025

Date of test: 02-Jun-2025

## Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	3257888	30-Jul-2025	SCL
Preamplifier	B&K 2673	3353200	29-Jun-2025	CEPREI
Measuring amplifier	B&K 2610	2346941	27-Jun-2025	CEPREI
Signal generator	DS 360	61227	24-Feb-2026	CEPREI
Digital multi-meter	34401A	US36087050	22-Apr-2026	CEPREI
Audio analyzer	8903B	GB41300350	19-Jun-2025	CEPREI
Universal counter	53132A	MY40003662	26-Jun-2025	CEPREI

## Ambient conditions

Temperature: (20.6~21.2) °C  
Relative humidity: (59.3~60.0) %  
Air pressure: (1010 ± 5) hPa

## Test specifications

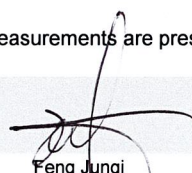
- 1, The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- 2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- 3, The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

## Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

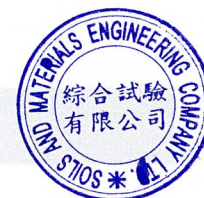
Details of the performed measurements are presented on **page 2** of this certificate.

Approved Signatory:

  
Feng Junqi

Date: 04-Jun-2025

Company Chop:



**Comments:** The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument. The results apply to the item as received.

**CERTIFICATE OF CALIBRATION**

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**1, Measured Sound Pressure Level**

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	(Output level in dB re 20 $\mu$ Pa)
			Estimated Expanded Uncertainty dB
1000	94.00	94.03	0.10

**2, Sound Pressure Level Stability - Short Term Fluctuations**

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

**At 1000 Hz** **STF = 0.012 dB**

Estimated expanded uncertainty 0.005 dB

**3, Actual Output Frequency**

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

**At 1000 Hz** **Actual Frequency = 1000.0 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

**4, Total Noise and Distortion**

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

**At 1000 Hz** **TND = 0.8 %**

Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by:

Fung Chi Yip

Date: 02-Jun-2025

Checked by:

Chan Yuk Yiu

Date: 04-Jun-2025

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.