



**Sorama**  
make sound insightful

**Whitepaper – Class 1 sensitivity of the Sorama CAM iV64**



## Introduction

The microphone arrays used in the Sorama CAM iV64, are made up of multiple micro-electro-mechanical systems (MEMS) microphones. The array is inspired by the natural sunflower seed pattern (see Figure 1) which provides improved acoustic imaging quality.

The sensitivity of these microphones, once installed to the housing of the device, changes and hence require recalibration. This document describes the calibration procedures which demonstrate that the Sorama CAM iV64 measure sound pressure levels at an accuracy that is on par with Class 1 sound level meters compliant to the IEC 61672 standard.

## IEC 61672 Class 1 specifications

The IEC 61672 standard specifies, among various requirements, the maximum deviations allowed when an acoustic measuring device is used to measure the sound pressure level.

The acceptance limits for a Class-1 Sound Level Meter (SLM) are shown in Figure 2.

## Calibration procedure

A free-field test needs to be conducted in order for the sunflower microphone arrays to meet the Class 1 acceptance criteria. This procedure is summarized below:

1. Place the array in a measurement room with a speaker source.
2. Play a white noise signal, and record the sound pressure level with the array.
3. Replace the array with a Class 1 SLM and repeat Step 2.
4. Subtract the response of the array from the response of the Class 1 SLM to obtain the calibration curve.
5. Apply the calibration curve to all new measurements of the array.

## Performance of Sorama CAM iV64

The measured difference in sound pressure level between Bedrock SM90 Class 1 SLM and Sorama CAM iV64 with a preliminary calibration curve applied is as shown in Figure 2. This measurement is obtained in Sorama's measurement chamber<sup>1</sup> using an omnidirectional speaker playing white noise at 88dB and is 1m away from the devices under test. In practice, measurement is usually conducted in a non-free-field sound field, which may result in difference when comparing between different SLMs.



Figure 1. (left) Sunflower seed, (right) Sorama CAM iV64.

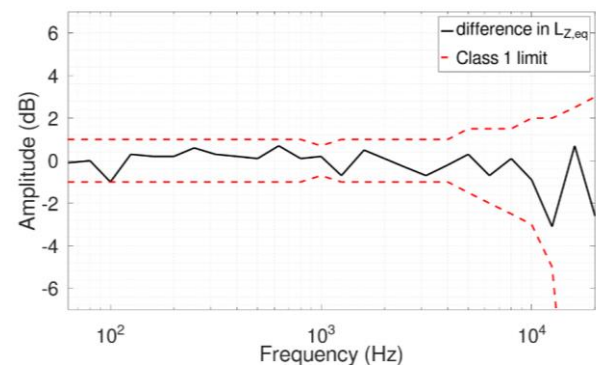


Figure 2. Difference in sound pressure level between a Bedrock SM90 Class 1 SLM and Sorama CAM iV64.

<sup>1</sup> Cube room with dimension of 2.6m x 2.6m x 2m, sound absorptive materials in all 6 surfaces, and average reverberation time T60 = 0.3s.