

What's the Difference Between a Class 1 and Class 2 Sound Level Meter?

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The standards that we work to, such as IEC 61672-1:2002 or BS EN 61672-1:2003, define a wide range of performance criteria that the instrument must meet. These criteria are often quite technically complex and detailed and have tolerances associated with them. In the current standard, IEC 61672-1:2002, there are two levels of tolerance and these are known as Class 1 and Class 2.

In an ideal situation, the instrument would meet the centre point or design goal of these criteria exactly and every sound level meter would measure exactly the same. However, every component in the sound level meter will have some form of tolerance or variation from one component to the next.

All of the electronic components used in a sound level meter such as resistors, capacitors and even microprocessors will have very slight differences and these all add up to give each instrument its own variation from the ideal. There are also other factors such as the uncertainty of the measurements made when an instrument is being designed or verified. The equipment used to test a sound level meter will itself have some level of tolerance and all of these factors add up.

What does it mean?

Because of these variations, manufacturers are allowed tolerances from the design goal. An example of this is in the frequency weighting and tolerance limits defined in IEC 61672-1:2002.

At the reference frequency of 1kHz, the tolerance limits for Class 1 are +/- 1.1dB and for Class 2 the tolerance is +/- 1.4dB.

At the lower and upper extremities of the frequency range, the tolerances are wider. At 20Hz, the tolerances are +/-2.5dB for Class 1 and +/- 3.5dB for Class 2.

At 16Hz, the tolerances are +2.5dB, -4.5 dB for Class 1 and +5.5 dB and $-\infty$ dB for Class 2. At higher frequencies, the same applies. The tolerances for a Class 1 instrument are tighter at frequencies above 8kHz with the tolerances at 10kHz being +2.6dB, -3.6dB for Class 1 and +5.6dB, $-\infty$ for Class 2.

At a higher frequency of 16kHz, the tolerances are +3.5dB, -17dB for Class 1 and +6.0dB, $-\infty$ dB for Class 2.

As you can see, at the extremities of the frequency range, a Class 1 instrument must have a better response and must meet the tighter tolerances.

It is quite difficult to give a simple answer to how accurate a Class 1 instrument would be verses a Class 2 instrument as there are many different points at which they would differ, but in simple terms, a Class 1 sound level meter will need to measure over a wider frequency range than a Class 2 instrument and meet tighter tolerances for all of its performance criteria.