

## **A few basic questions and answers regarding proper sound measuring in the field**

I understand that the meter has to be set up at a particular height above the ground etc. Just how high does it have to be?

Typically 1.5 to 1.7 m above ground for outdoor measurements, but of course it depends where your noise receivers of concern are located.

When measuring the sound coming off a playing field (soccer etc.), is the A or the C-scale to be used, at slow or fast response?

Use A-weighted for most community noise work, unless there is prominent low-frequency content such as from a nightclub music.

The meter response setting determines how well the meter display can follow time-varying sounds. It should then be selected to suit the type of noise being measured. For steady noise sources like fans or pumps, or for slowly varying noises like that from a vehicle passby, Slow response is adequate. The Slow response setting makes it easier to read/track the meter display. However, if noises are highly variable, such as the noise from a sports field, or a busy construction site, the Fast response should be used as it is much more capable of tracking sound level variations and giving more realistic maximum levels. Most noise bylaws specify the meter setting to be used. In general it is better to use Fast, particularly when using a logging SLM which does not then rely on the operator to read the display.

Which frequency range exactly does the A-scale and the C-scale respond to?

Both cover the full audible range – 20 Hz. the 20K Hz. However, the A-weighting applies larger corrections (reductions) to sound levels measured at lower frequencies (below about 800 Hz.) so as to replicate the ear's sensitivity to sound at low to moderate intensities. Under the C-weighting, these low-frequency corrections are much smaller, corresponding to the ear's sensitivity at higher sound intensities .

When taking readings for official use, do you calibrate the meter(s) after each reading or is it enough to have a recently calibrated meter?

It is best to calibrate the meter immediately before and after the measurement if it will possibly be contested.

When measuring in a windy condition, does one need a specially covered microphone?

Yes, typically the windscreens provided with instrument quality meters (Type 1 and 2 SLM's) will permit measurement in winds up to about 20 kmph without significant effects. Without the windscreens, you really can't tolerate much wind at all. Therefore it is best to always use the windscreen when outdoors.

Do you take several readings at certain time intervals and then calculate an average?

If the noise you are measuring is essentially steady (such as a from fan or pump) and you are quite close to it, then a single measurement of say 30 seconds will do. If the noise is variable, such as a machine going through several stages of an industrial process, then you will need to do some sort of averaging – ideally by measuring over a long time period (several times the duration typical of the typical work cycle. If the noise varies randomly or unpredictably, then you may want to conduct several isolated measurements and average the results. It's also good to note to

the variability of the individual measurements so that you can compute a mean value and the standard deviation. Some older noise bylaws actually require that all noise measurements be repeated 5 or 6 times and the average result taken. More recently, community noise bylaws (such as the City of Victoria's) have adopted the equivalent sound level, or Leq, as their basic noise metric, thereby building sound energy averaging into the measurement process.

Above questions were posed by the Right to Quiet Society and kindly answered by

Clair W. Wakefield, M. A. Sc., P. Eng.

President,

Wakefield Acoustics Ltd.

301 - 2250 Oak Bay Avenue,

Victoria, B.C., V8R 1G5

Phone [\(250\) 370-9302](tel:2503709302)

Fax (250) 370-9309

[www.wakefieldacoustics.com](http://www.wakefieldacoustics.com)