Taken from: www.norsonic.no/en/applications/measuring_sound/adding_sound_sources?

Adding sound sources

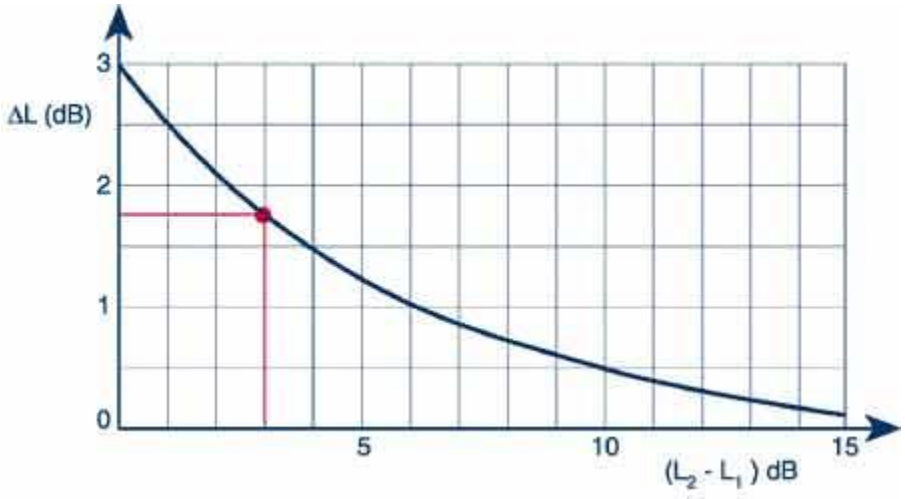
When you start to measure noise, you are going to encounter situations where you need to add sound pressure levels.

For example, you may be engaged in noise measurements in a workshop without being able to measure with all machines running simultaneously - maybe just a few of them are running at the time. If you stay there for a while, you will get the data you for all machines, but not the overall sound pressure level in the room when all machines are running.

What do you do then? Well, if you are good at mathematics, you may of course start calculating the resulting sound pressure level based on the level of each machine. The rest of us don't do that. There are easier ways. We simply use a graph made specifically for this.

The graph is used to calculate the sum of two noise levels. It can be used for more sources, of course, but they must be added two and two. To add three sources, you just add two of them and the result is then added with the third.

Observe that no machine must be measured more than once. Otherwise the graph procedure won't work correctly.



To add two sound pressure levels coming from two independent sources, a special graph is used.

Example of use: Measure the sound pressure levels of machine Nos. 1 and 2. Assume these turn out to be L1 = 85dB and L2 = 88dB. The difference is then 88 - 85 = 3dB. Find the 3dB point along the horizontal axis. Go up until you intersect the graph and then into the vertical axis. You will find a delta L value of approximately 1.8dB. Add this value to the level of noisiest machine (the sum must be louder than the noisiest) and get a resulting level of 88 + 1.8 = 89.8dB approximately 90dB!