

The A-weighting tolerance limits of current Sound level Meters

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- The current international sound level meter standard IEC 61672-1 (2002): Specifications, has A-weighting tolerance limits that allow less capable microphones to be used in Class 1 instruments. (Fig. 1)
- Under the above IEC standard, microphones that are not capable of measuring sound such as those impact sounds in factories with harmonics beyond 16 kHz, can be used in IEC Class 1 sound level meters (SLMs).
- As shown, for Class 1 IEC SLMs, the high frequency cut-off is at 16 kHz.
- For an IEC 61672 SLM, the manufacturer can incorporate a less capable microphone that cut off at 16 kHz, in a SLM and calls it a Class 1 instrument.
- At the Low frequency end, the IEC 61672 SLM cuts off at 16 Hz as opposed to the specification in ANSI S1.4 that has limits of ± 4 dB at 10 Hz.
- The L. F. cut off at 16 Hz, creates some problems in measuring L. F. rumble.
- As a comparison, the corresponding tolerance limits for the amendment ANSI S1.4A to the current ANSI sound level meter standard ANSI S1.4-1983 is also shown in Fig.1. It has a tighter tolerance limits, and specifies for SLMs that may operate to 100 kHz.
- Fig. 2 shows B. W. Lawton's summary for damage to human hearing by airborne sound of very high frequency or ultrasonic Frequency. (The web address to down load a copy is shown below the figure). His "high frequency" starts at around 20 kHz.

Conclusion

- The new tolerance limits given in IEC 61672 (2002) cuts off most of the high frequency harmonics in impulsive situation, and will harm future hearing conservation effort.

Fig 1: A-weighting tolerance limits for Class 1 sound level meters

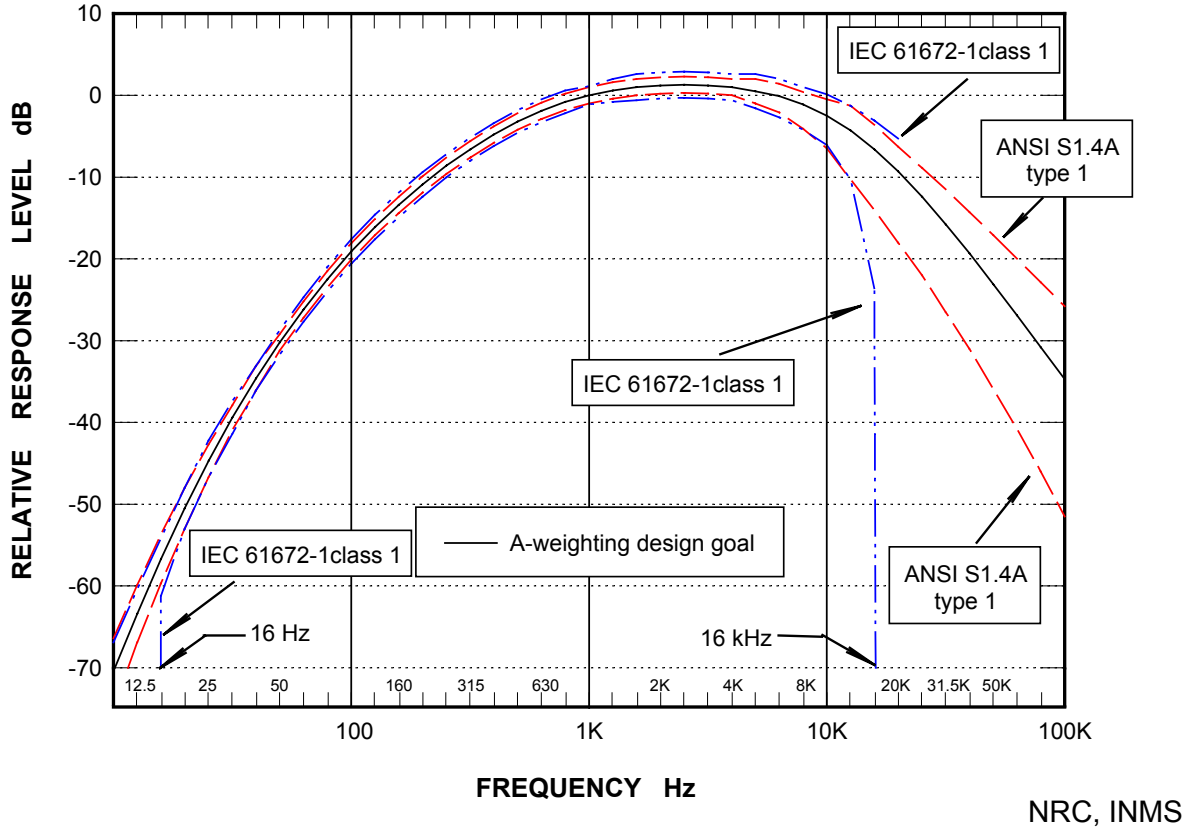


Fig. 2: Damage to human hearing by airborne sound of very high frequency or ultrasonic Frequency

