

Are the new RA0403 and RA0404 Hi-Res ear simulators better than the RA0401 and RA0402 High-Frequency ear simulators?

RA0403 and RA0404 Hi-Res ear simulators are not necessarily better or worse than RA0402 and RA0403 High Frequency ear simulators. Using RA0403 and RA0404 ear simulators can have some advantages but also disadvantages depending on the application:



Figure 1. Comparison between RA0401/2 High Frequency ear simulators VS RA0403/4 Hi-Res ear simulators. Green indicates an advantage against the other ear simulator, while red indicates disadvantage.

RA0403/4 Hi-Res ear simulators has a damping system that attenuates the length-related resonances above 10 kHz. The use of a 1/4" microphone also extends the useful frequency range to 50 kHz and beyond. The 60318-4 standard calls for a 1/2" microphone and this is the only reason why the Hi-Res Ear Simulator is not standard-compliant, but "only" standard-compatible, as it fully complies with the standard in all other respects.

The use of a less sensitive 1/4" microphone capsule allows the RA0403/4 to be used to measure up to higher sound pressure levels compared to RA0401/2. The lighter diaphragm from the 1/4" microphone will also allow us to use the Hi-Res simulator to test up to higher frequencies. The disadvantage is that, due to its reduced sensitivity, a 1/4" microphone will have a higher noise floor compared to a 1/2" capsule.

In summary, RA0403/4 is ideal for reliable testing above 10/20 kHz and up to 50 kHz (ideal for Hi-Res certification). Testing under high sound pressure level conditions up to 166/169 dB is also a plus, but at the expense of increasing the noise floor to 44 dBA.