



**CONSUMER  
TECHNOLOGY**

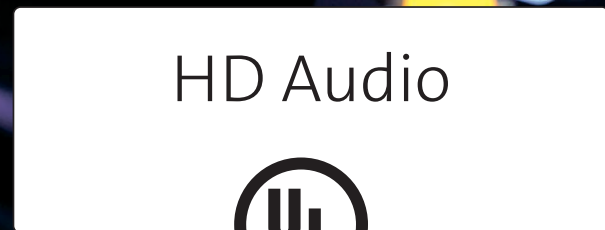


# **AUDIO QUALITY VERIFICATION**

**AUDIO QUALITY AND HD AUDIO PROGRAM**

# PERFORMANCE VERIFICATION OF HD AUDIO DEVICES

Manufacturers, retailers and customers can now see visible, verifiable proof of a product's HD audio quality – right on the package, label and product. UL's Audio Quality and HD Audio Program provides objective, industry-standard testing of the performance quality of audio recording and playback devices.



## THE UL HD AUDIO VERIFICATION MARK

The UL HD Audio Verification Mark provides both audio device manufacturers and their customers with an independent quality mark that they can trust. It confirms and validates that customers are getting the quality they expect, by establishing an empirical, industry-wide standard.

UL verifies claims of subsonic and ultrasonic (HD audio) performance by authentication of digital audio files for sample rate and bit depth performance, and evaluates audio devices based on quality of playback and performance.



## TESTING OBJECTIVES

UL's Audio Quality and HD Audio Program is designed to evaluate audio recording and playback devices such as headphones, recorders, and playback devices (e.g. portable music players). Testing is performed by the UL Audio Lab, and provides evidence-based results that prove the audio devices adhere to their reported specifications.

Where applicable, testing results will:

- ▶ Verify the measurements stated by the manufacturer.
- ▶ Determine whether devices meet stated "High Res" or "HD" standards.
- ▶ Provide a quantitative metric of the quality of a device, and for comparison to other devices.
- ▶ Verify the device sample rate and bit depth recording and/or playback capabilities.
- ▶ Deliver measurable data to support any subjective testing.
- ▶ Validate measurements according to the UL HD Audio guidelines.

## DELIVERABLES

- ▶ Test status reports are provided to the customer on a daily basis.
- ▶ Draft report will be provided for client's review at the conclusion of the testing cycle.
- ▶ Final report will be issued upon client's approval.
- ▶ If the device qualifies for the UL HD Audio Verification Mark, a request will be submitted to the appropriate review board.

## TEST ENVIRONMENT

The following equipment (or equivalent) will be used for the objective audio testing:

### Audio Precision

APx500 Software v4.2.1  
APx525 Audio Analyzer

### Pro Tools HD

Version 12.4.0  
Avid Native Thunderbolt  
Interface  
Avid HD I/O – 8x8x8

### Chord Electronics

Mojo Headphone  
Amplifier/DAC

### Manley Force

Microphone Preamp

### Bruel & Kjaer

4128C – Head and Torso  
Simulator (HATS)

### G.R.A.S.

45BC – KEMAR Head  
& Torso,  
46BP 1/4” LEMO Pressure  
Standard Microphone Set  
(10Hz – 70kHz)

## TEST DESCRIPTIONS

(where applicable to the DUT)

### FREQUENCY RESPONSE

This test measures the output level in dB of a device across a range of frequencies. The results of the test will reveal how much the output level varies at certain frequencies and the overall frequency range achieved.

### PHASE & POLARITY

This test measures the time relationship of a stimulus signal in two channels of an audio device. The results of this test will reveal if the audio device can appropriately reproduce a stereo effect.

### SIGNAL TO NOISE RATIO

This test measures the ratio of the output noise and the output signal to determine how much noise is present at the output of an audio device.

### TOTAL HARMONIC DISTORTION PLUS NOISE

This test measures any extraneous audio coming from the device, combining both unwanted harmonic content and noise (the energy at the output not related to the input signal).

### LEVEL

This test measures the maximum level of signal output that can be achieved by the device before distortion.

### CROSSTALK

This test measures the amount of bleed between two channels in an audio device.

### DRIVER MATCHING (LEVEL RATIO)

This test measures the ratio of signal levels between two channels to determine if the channels have different level performance characteristics.

### PLAYBACK ANALYSIS

Utilizing various audio analysis tools, we will verify the device is able to playback files at all available sample rates and bit depths. This test will also verify that the device playback will achieve the HD frequency response range.

### RECORDING ANALYSIS

This test verifies the ability of the DUT to capture audio at all available sample rates and bit depths through all available inputs (built-in microphones, line-in, microphone-in, etc.)

*Given my professional commitment to audio quality and performance creating advanced speakers and recording equipment, I have often been shocked by outrageous claims by some audio manufacturers. Our “Respect The Music Foundation” has made audio quality and listener education a major focus of its overall mission to expose people to proper sound and appreciation of music. Now, with UL’s HD audio evaluation program, manufacturers and consumers will be able to identify products that actually support HD Quality Audio by looking for the UL Mark. This will help advance the state of sound quality and listening pleasure for all.*

**David Wiener**, founder of the non-profit  
Respect The Music Foundation



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