MAC Encore™ Performance
CLD and WRM
Acoustic Test Report

Martin by HARMAN

Title

MAC Encore Performance Acoustic Test Report

Test conditions

Test carried out according to ISO 3744:2010(E)

Device tested

Make: HARMAN Professional Denmark ApS

Model: MAC Encore Performance

Serial no: 14200000306

Software version: 1.0.0

Results

An image of the test setup can be found on page 4. Test results are listed in Table 1 and Table 2 on pages 5 and 6.

HARMAN Professional Denmark ApS, R&D QA are responsible for the test results given in this report.

Environment

Temperature: 25.2°C Ta

Humidity: 46.2 %RH

AC mains power: 230 V, 50 Hz

Warm-up time: Minimum 30 minutes at full intensity.

Fixture placement: Fixture was placed at least one meter from walls and ceiling, as described in the Standard ISO 3744:2010(E)

Remarks

Test results apply only to the tested specimen.

Rev: (last five)	Made by:	Description:	Approved by:	Date approved:
A	Dennis Svane	MAC Encore Performance Sound Measurement	Markus Klüsener	2017-09-21

Setup

The product was placed indoors in a hemi-anechoic chamber at the test facility of DELTA in Aarhus, Denmark (see Figure 1). The ceiling and walls were all acoustically absorbent and the floor was reflective. The main dimensions of the room were 12 m x 8 m x 4.5 m (length x width x height).

Figure 1: Test setup

The product was allowed a minimum of 30 minutes of warm-up time before measurements were performed.

Measurement method

Measurements were carried out using a setup with 4 microphones. The microphones were in turn moved to the measurement positions described below.

Measurement setup:

- Hemispherical measurement model
- 10 microphone positions in total
- Measurement surface area: 22.7 m^2

Instrumentation

Please refer to Page 7 for a full instrumentation list.

Results

The MAC Encore Performance was measured in 5 different scenarios:

1. All effects static, Light source ON, 100% output white light - Regulated Fan Mode
2. All effects static, Light source ON, 100% output white light - Constant Fan Mode Full
3. All effects static, Light source ON, 100% output white light - Constant Fan Mode Medium
4. All effects static, Light source ON, 100% output white light - Constant Fan Mode Low
5. All effects static, Light source ON, 100% output white light - Constant Fan Mode Ultra-Low

Sound Pressure Levels are listed in Table 1 below. Results of Sound Power Level measurements are listed in Table 2 on Page 6.

Sound Pressure Levels					
Distance from fixture	Regulated Fan (Max Output) **[dB(A)]**	Constant Fan Full **[dB(A)]**	Constant Fan Mid **[dB(A)]**	Constant Fan Low **[dB(A)]**	Constant Fan Ultra-Low **[dB(A)]**
LpA at 0m	46.0	51.0	47.7	44.6	42.5
LpA at 1m	38.0	43.0	39.7	36.6	34.5
LpA at 4m	26.0	31.0	27.7	24.6	22.5
LpA at 7m	21.1	26.1	22.8	19.7	17.6

Sound Pressure Levels have been converted from Sound Power Levels using the formula: LpA = (LwA – $\text{reduction}_{\text{distance}}$)

Reductions used: 8dB(A)@1m, 20dB(A)@4m, 24.9dB(A)@7m

Table 1: Sound Pressure Levels

The measurement results corrected for background noise are listed in the table below for 1/1-octave band and A-weighted values. Results marked with an (*) do not meet the 6 dB criterion in clause 4.2.1.1 of ISO 3744:2010(E) for the difference between measured sound power level and background noise.

1/1 Octave bands and A-weighted sound power levels

Measured Sound Power Levels					
1/1 Octave band, Hz	Regulated Fan (Max Output) **[Lw, dB re.1pW]**	Constant Fan Full **[Lw, dB re.1pW]**	Constant Fan Mid **[Lw, dB re.1pW]**	Constant Fan Low **[Lw, dB re.1pW]**	Constant Fan Ultra-Low **[Lw, dB re.1pW]**
63 Hz	10.4*	13.1	13.1	10.4*	10.9*
125 Hz	21.4*	23.4	22.2*	21.3*	21.2*
250 Hz	35.7	41.4	38.6	35.3	34.3
500 Hz	40.9	46.4	43.1	40.3	37.9
1000 Hz	42.3	46.5	43.5	40.1	37.3
2000 Hz	37.3	42.9	38.8	35.5	33.8
4000 Hz	28.8*	33.5	29.7*	28.0*	28.0*
8000 Hz	27.0*	28.7	27.3*	26.6*	26.4*
A-weighted (LwA, dB re.1pW)	**46.0**	**51.0**	**47.7**	**44.6**	**42.5**

These results are corrected for background noise with a maximum of 1.3 dB only.

Results marked with a (*) do not meet the 6 dB criterion in clause 4.2.1.1 in ISO 3744:2010(E) for the difference between measured sound pressure level and background noise.

Table 2: Measured Sound Power Levels

Instrumentation

No.	Equipment	Make	Type
02L021	Calibrator	Brüel & Kjær	4231
14L002	Data acquisition card	National Instruments	NI9233
14L004	Data acquisition card	National Instruments	NI9233
06L038	½" Microphone	G.R.A.S	40AE
06L060	½" Microphone	G.R.A.S	40AE
06L063	½" Microphone	G.R.A.S	40AE
06L064	½" Microphone	G.R.A.S	40AE
09L032	Preamplifier	G.R.A.S	26CF
09L037	Preamplifier	G.R.A.S	26CF
09L044	Preamplifier	G.R.A.S	26CF
09L045	Preamplifier	G.R.A.S	26CF

Table 3: Instruments Used

The programs *noiseLAB Capture Professional version 4.0.4* and *Batch processor version 4.1* were used for recording and analysis. All instruments and programs are calibrated regularly in accordance with DANAK guidelines.