

JA-8008 HMQ



Paper Cone Mid-Woofer

Driver features, as described by Mr. Troels Gravesen, who has designed and developed the JA-8008 HMQ:

Voice coil former:

The voice coil available at that time was wound on an aluminum voice coil former. Aluminum voice coil formers introduce damping of cone movement by shorting eddy current around the magnet gap.

The result was low mechanical Q, actually 1.7, which is not too bad, but one thing that *can* characterise vintage drivers is low mechanical loss and a more vivid and dynamic presentation. I write *can* characterise, because I've had vintage drivers that did not have high Qm despite paper voice coil formers and "low-loss" suspensions.

Low-loss suspensions were sometimes added some viscous resin to strengthen the suspension and ensure long-term stability - but also had the impact of introducing a lot of damping to cone movement.

The aluminum voice coil former is now replaced by a fiber glass voice coil former with similar properties of e.g. Kapton and titanium. The result is an huge increase in Qm, actually I measure Qm = 10 from the driver samples fitted with a center phase plug.

Surround:

Foam surround is one of the best surround materials available when it comes to low-loss suspensions. This primarily due to low mass and excellent elastic properties, and when applied a suitable coating it will also have a reasonable life-span.

What was not available back then (stock item) was foamed rubber surrounds as an alternative to coated foam. Foamed rubber provides lower mass compared to the standard rubber used for bass drivers and in many ways properties similar to foam surround. The new JA8008-HMQ is fitted with a narrow (low mass) foamed rubber surround added a damping ring to reduce the all too common ~800 Hz resonance.

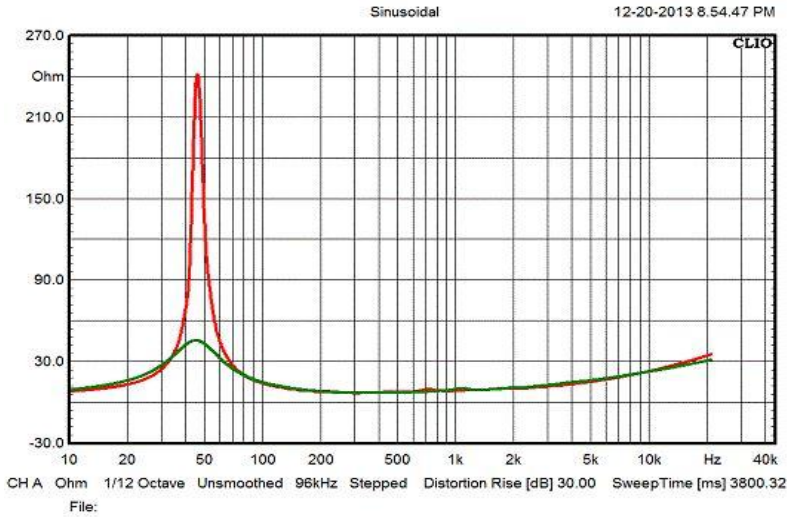
Phase plug:

Phase plugs were actually available at the time the JA8008 was put together, but discarded as it did not offer any sonic advantages to the paper dust cap. With the current driver the phase plug offers the best frequency response and the highest mechanical Q, thus phase plug it must be. The phase plug is held in place by a solid copper ring above pole piece.

Magnet size:

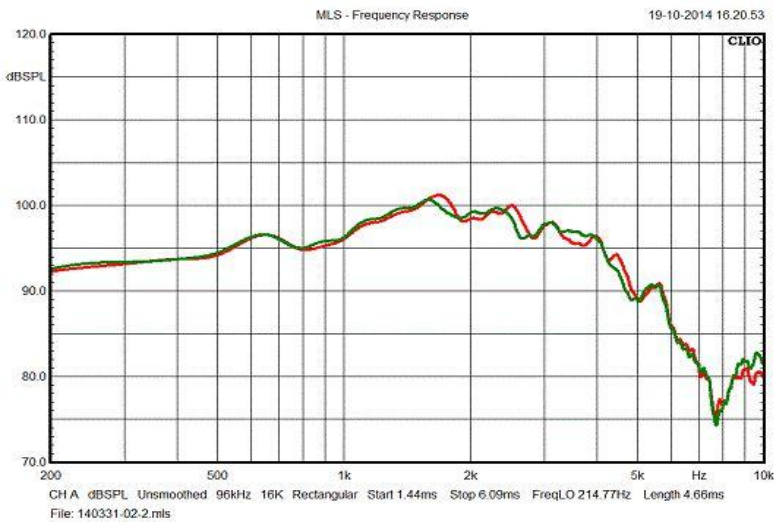
The magnet size has been increased on the new driver to compensate for slightly increased mass of suspension and loss of radiating area of cone (no dust cap) and we maintain an efficiency of 94 dB/1W/1m making 95 dB/2.8V/1m sensitivity.

Measurements:



MANUFACTURER	SEAS
MODEL	JA8008-HMQ
Fs	46
Re	6.07
Rms	0.52
Qms	10.0
Qes	0.26
Qts	0.25
Cms	0.66
Mms	18.0
BL	11.1
VAS	44.3
dB SPL	94.3
L 1kHz	0.491
L 10kHz	0.374
SD	0.0219
MMD	16.2

TS data JA8008-HMQ driver.



Above the two most important measurements: On the top graph we see free air impedance plots of the old JA8008 (green) and JA8008-HMQ (red). Due to the new voice coil former we see a huge peak at point of resonance, which results in a whopping $Q_m = 10$. This is what I wanted - and even better than anticipated.

On the bottom graph we see the frequency response from two drivers mounted on a 28 cm wide baffle. Remember frequency response is highly dependent on the shape and size of the front panel but I find a 28 cm baffle more relevant than an infinite baffle in presenting a driver.