



The NEO-3 – a high performance wideband, planar - magnetic transducer

The NEO3 is the first planar-magnetic (ribbon) transducer that uses an innovative high-tech diaphragm material called Kaladex[®] from Dupont. This material, combined with a new proprietary technology for etching the aluminum/Kaladex[®] laminate, makes it possible to overcome the usual limitations of previous generation planar-magnetic designs. Traditionally most planar drivers were built using a Mylar[®] diaphragm but Kaladex[®] has a much higher thermal limit, lower mass, better durability and mechanical stability. As a result, the NEO3 has both higher sensitivity and power handling as well as excellent sound quality. The careful design and unique assembly technology employed by the NEO3 allow for more extended high frequency output, less distortion, and higher dynamic range than with few other planar drivers of similar size.

The NEO3 has a push-pull symmetrical magnet system that has been designed with the help of Finite Element Analysis software to achieve optimum efficiency/cost performance. It uses the newest grades of neodymium – the “super” magnet material with the highest magnetic energy. The extremely light Kaladex[®] diaphragm with an etched planar aluminum conductor is suspended in a magnetic field and is uniformly driven by the electromagnetic force providing accurate and immediate reproduction of the input signal. There are no heavy voice coils, spiders, glue joints, paper cones and surrounds. Hence there is no cone break-up resonance, distortion, phase incoherency or signal smearing that is common for conventional drivers. With the NEO3 there is virtually nothing between the electrical signal and the sound - just an almost weightless diaphragm. No other commercially available loudspeaker transducer is so pure and so “minimalistic”. No wonder the NEO3 delivers clean, airy, transparent sound that is inherently natural and musically pleasing.

The purely resistive impedance of the NEO3 makes an easy load for a power amplifier and greatly facilitates crossover design. The magnet system is completely shielded for safe implementation in multimedia and AV systems. The NEO3 is a very versatile driver and its applications are limited only by the designer’s imagination.

Objective measurements of the NEO3 illustrate some of the unique features of this driver that contribute to the “magic” that lies behind its sound.

Fig. 1 shows the frequency response of a standard NEO3 measured at 1 meter for a 2.83V input as a monopole mounted on a small 10” x 22” baffle that closely resembles a typical front panel of a speaker system. SPL is quite smooth with ± 2.5 dB tolerance in the 1.8 kHz– 17 kHz range with an extremely high sensitivity of 96.5 dB/1m/2.83V. This gives a designer a lot of room for response adjustments, potentially resulting in a ± 1.5 dB SPL tolerance within the system. The NEO3 is also an excellent choice for high sensitivity speakers designed with tube amplification in mind, studio monitors, as well as various contemporary AV systems with shallow profiles and

limited amplifier power where the superior video picture quality demands equally accurate high fidelity sound.

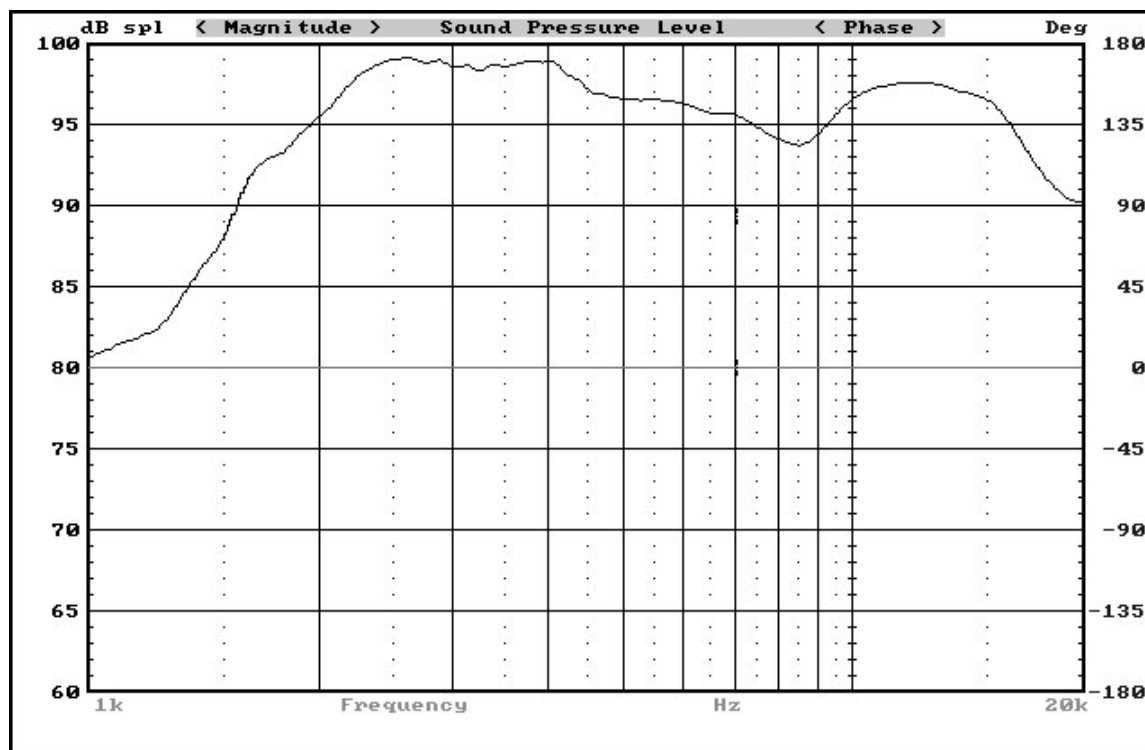


Fig. 1 NEO3 on-axis frequency response

Fig. 2 shows on-axis and off-axis frequency response curves of a standard NEO3 in the same condition as above (0° - upper solid; 15° - dash; 30° - dash/dot; 45° - lower solid).

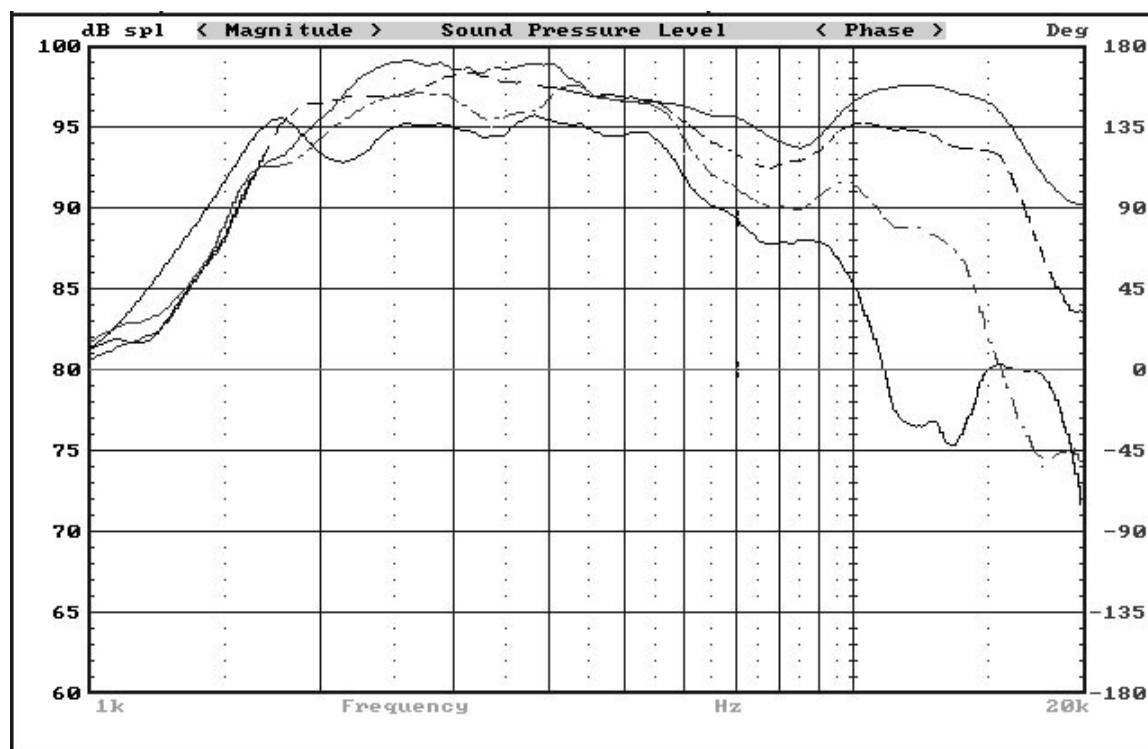
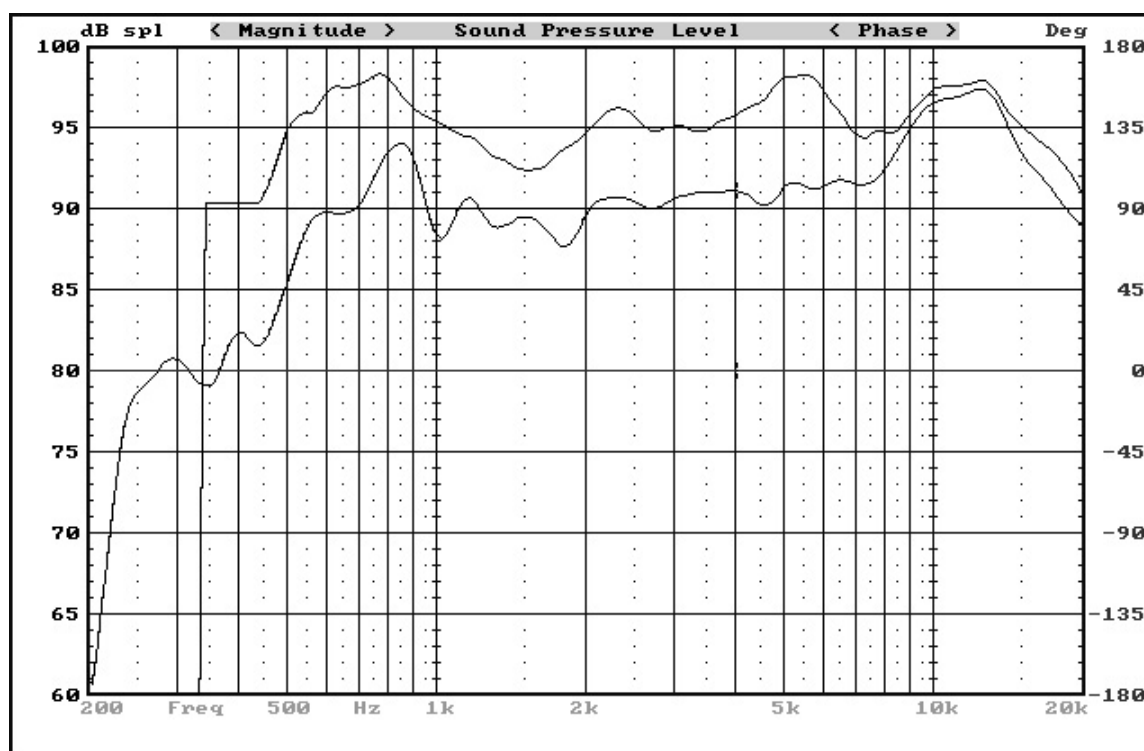


Fig. 2 NEO3 on and off-axis frequency response

Since the smooth 15° off-axis response is largely identical to the on-axis curve, the result is balanced reproduction provided by direct sound. Further off-axis the NEO3 has a slightly controlled dispersion. This allows for better subtle detail resolution and superior intelligibility. Being smooth and balanced the extreme off-axis response will provide sufficient space envelopment and a wide soundstage. Fig. 3 shows the frequency response of an array of four (upper curve, 4 ohm impedance) and two (lower curve, 8 ohm impedance) vertically placed raw NEO3 drivers at 1 metre for a 2.83V input. The drivers were placed close to each other with a 1" deep damped rear enclosure in a 10"x22" baffle. These configurations can be used very successfully for a number of different applications with a crossover frequency as low as 1000 Hz.

For a standard single NEO3 the recommended crossover frequency is 2000Hz –2500Hz. In this case the driver can be used in a system with virtually any 6" or even 8" woofer that possesses similar sound accuracy and resolution as the NEO3.



**Fig. 3 NEO3 vertical array frequency response
(4 NEO3 – upper curve, 2 Neo3 – lower curve).**

Fig. 4 shows the Cumulative Decay Spectrum (CDS) plot of the NEO3. Even the best conventional tweeters have decay times around 1ms (-30dB decay level) extending to 2-2.5 ms at the lowest frequencies of their effective range. The NEO3 has a decay time about 0.5ms across most of its effective range extending to 1ms at 2kHz. The absence of complex mechanical parts, common for a conventional driver, allows the NEO3 to perform free of delayed spectral contamination with unsurpassed clarity, accuracy and transparency of sound.

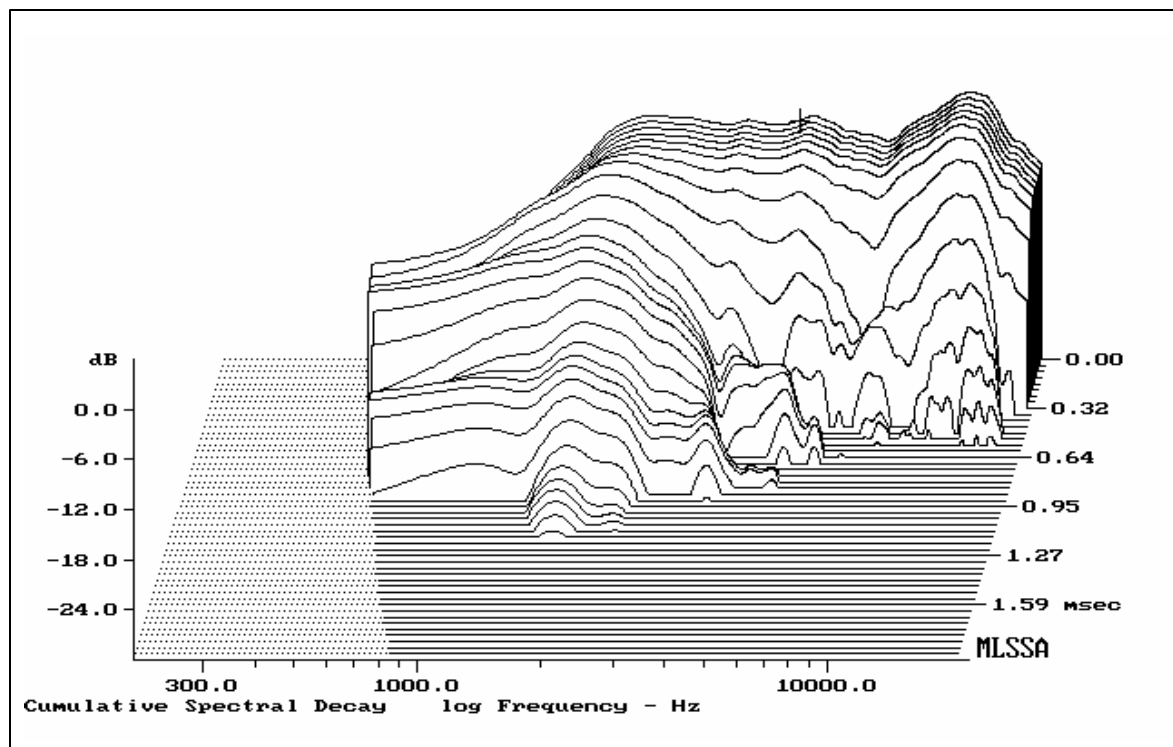
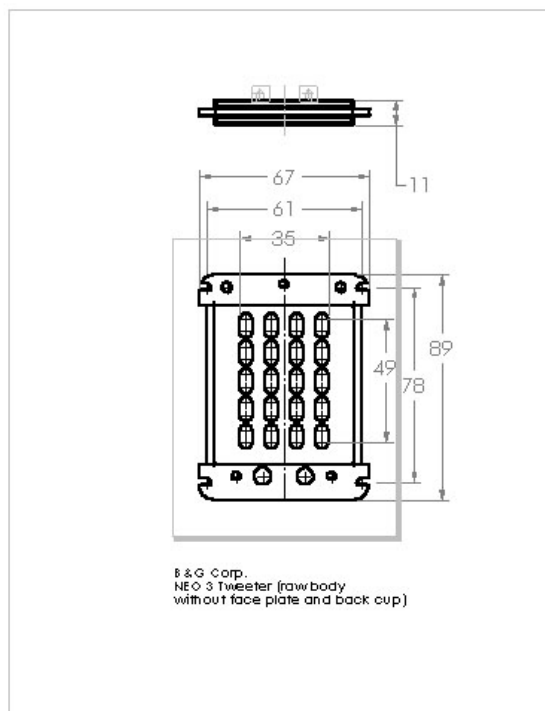
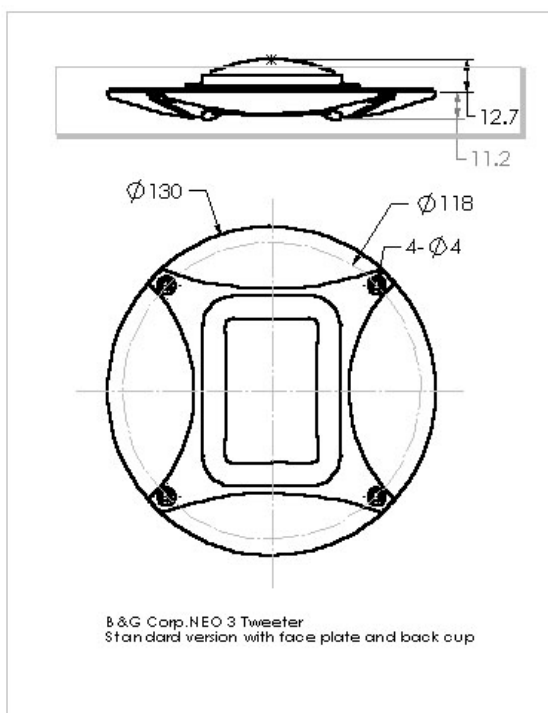


Fig. 2 NEO3 Cumulative Decay Spectrum (-30dB floor)

Specifications

1	Effective frequency range (recommended LF crossover point): Standard driver (monopole) Dipole or with a tuned rear chamber or in an array	2000 Hz – 20000 Hz 1000 Hz - 20000 Hz
2	Sensitivity (2.83V/1m)	96.0 dB
3	Impedance (resistive) DCR	4 ohm 3.5 ohm
4	Power handling: RMS Program Peak	10 W 20 W 50 W
6	Weight	260 g



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