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VOICE COIL®

THE PERIODICAL FOR THE LOUDSPEAKER INDUSTRY

Scan-Speak R3004/664000

Now that Scan-Speak is back on their own again and no longer a part of DST or Tymphany, we are seeing many great transducers being offered by this prestigious driver manufacturer. Founded in 1970, Scan-Speak is still working out of the same address in Videbaek, Denmark, and with the same "no compromise" philosophy that was always a part of the Scan-Speak mission. This month, Scan-Speak sent me another tweeter using their AirCirc motor. Basically, this device utilizes the Revelator D29 Revelator dome wide surround concept, but with a 99% beryllium (no fake beryllium here!) dome coupled to the highly effective AirCirc neodymium magnet system.

PHOTO 2: Scan-Speak D3004.

Scan-Speak's unique AirCirc magnet system, named for the way it optimizes airflow within the chamber, rearranges the traditional magnet structure from a single magnet to an open magnetic circuit composed of six separate neodymium slugs. This, in combination with the chamber, results in the elimination of the reflections and resonances that compromise the performance of traditional tweeter motors. This is perhaps the single factor that differentiates really great tweeters that not only deliver upper harmonic musicality, but enhanced detail that results from not having a flat pole or neo slug immediately behind the dome. Other features include a rubber painted aluminum faceplate with a protective grille (you don't want your neighbor's three-year old putting his/her finger into your $615 retail tweeter!) and gold-plated terminals.

I began testing the R3004/664000 beryllium dome by generating a stepped sine wave impedance plot using the LinearX LMS analyzer. The result of the LMS 300-point impedance sine wave sweep is given in ***Fig. 17***. The tweeter resonance is 480Hz. Minimum impedance for this tweeter is 3.12Ω at 2.8kHz with a measured Re = 2.9Ω.

After completing the impedance measurements, I recessmounted the Scan-Speak tweeter in a small enclosure that had a baffle area of about 12″ × 7″ and measured the on- and off-axis frequency response at 2.83V/1m. ***Figure 18*** depicts the on-axis response. Frequency response for the R3004/66400 is a very flat ±2.0 from 850Hz-14.5kHz. ***Figure 19*** gives the on- and off-axis response. Off-axis the

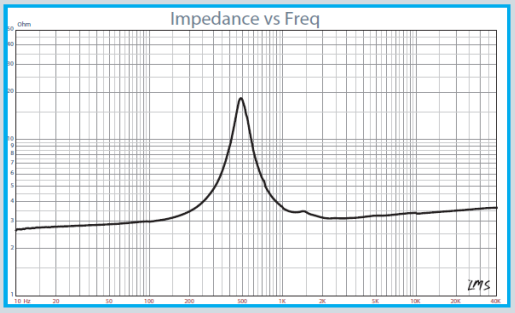

FIGURE 17: Scan-Speak D3004/664000 free-air impedance plot.

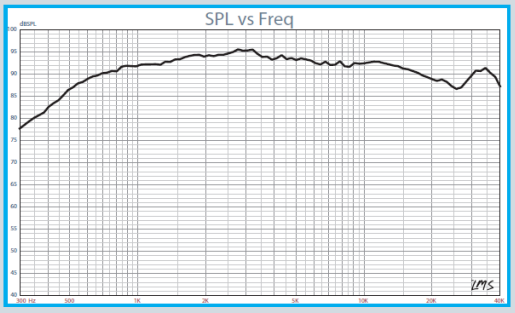

FIGURE 18: Scan-Speak D3004/664000 on-axis response.

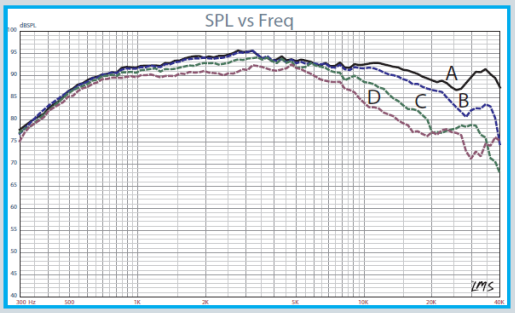

FIGURE 19: Scan-Speak D3004/664000 horizontal on- and off-axis frequency response (A = 0°; B = 15°; C = 30°; D = 45°).

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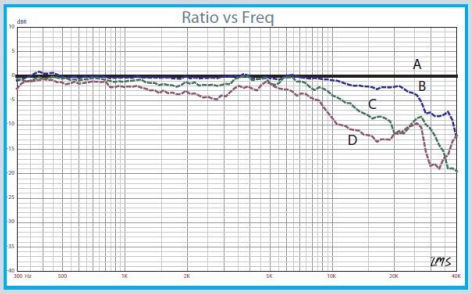

FIGURE 20: Scan-Speak D3004/664000 normalized on- and off-axis frequency response (A = 0°; B = 15°; C = 30°; D = 45°).

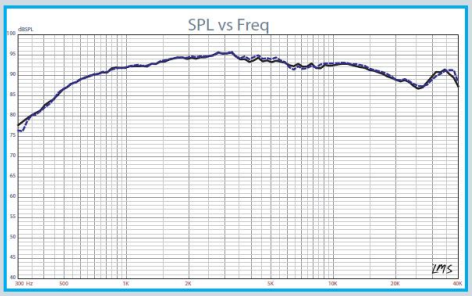

FIGURE 21: Scan-Speak D3004/664000 two-sample SPL comparison.

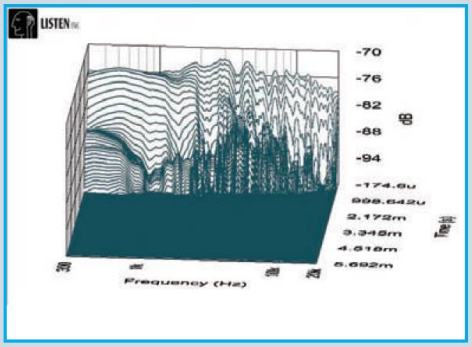

FIGURE 22: Scan-Speak D3004/664000 SoundCheck CSD waterfall plot.

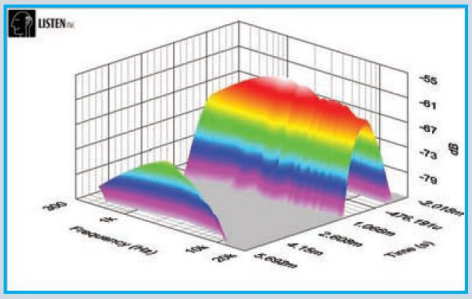

FIGURE 23: D3004/664000 SoundCheck STFT surface intensity plot.

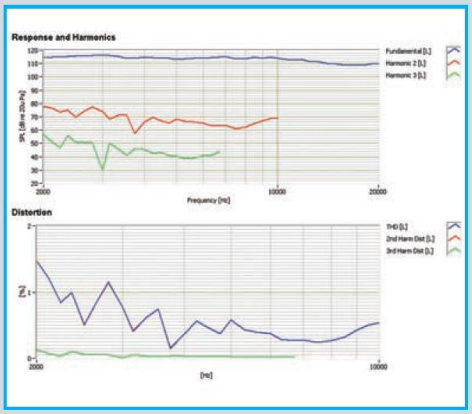

FIGURE 24: Scan-Speak D3004/664000 SoundCheck distortion plots.

device is -3.9dB down at 10kHz from the on-axis response with respect to the 30° off-axis curve and -8.7dB at 45° off-axis, again with respect to the on-axis response. ***Figure 20*** illustrates the normalized version of ***Fig. 19***. In terms of production consistency, the two-sample SPL comparison is depicted in ***Fig. 21***, indicating the two samples were well matched with some minor variation in the 3.5-10kHz region.

Next, I used the SoundCheck analyzer and SCM microphone to measure the impulse response with the tweeter recess-mounted. Importing this data in the SoundMap software produced the cumulative spectral decay plot (waterfall) shown in ***Fig. 22***. While there are no major resonances indicated in this plot, it is very difficult to correlate long decay resonances with subjective performance. ***Figure 23*** gives the Short Time Fourier Transform (STFT) displayed as a surface plot.

Last, I set the 1m SPL to 94dB (5.8V), and the sweep range to 2kHz-20kHz and measured the 2nd and 3rd harmonic distortion at 10cm (***Fig. 24***). This is shown in order to see the relationship between 2nd and 3rd harmonic distortion; however, correlation to subjective preference based on THD is not well established. For those manufacturers who have wanted to field a beryllium tweeter like some of the highest end system designs in the field, Scan-Speak has come up with the best of all possible worlds, the AirCirc motor and a real beryllium dome.