

Lowther drivers in Teresonic speakers

There is an almost universal love of music throughout all societies because of the emotional impact that music can have on our lives. It can express happiness, sorrow, joy, or just make for a good party. When we try to bring music home, we do it so that we can to enrich our lives, bringing home these emotions that make us love music.

Lowther drivers are unique. Utilizing a principle developed more than 50 years ago, the Lowther design concept is stronger than ever. Audiophile fads come and go, but once you've acquired the Lowther audiophile sound, it's Lowther for life! Read more about Lowther history at:

<http://www.lowthervoigtmuseum.org.uk/history.html>

Reproduced music typically lacks the dynamic contrast produced by live music. Sudden bursts of noise, the pause of silence, a dramatic increase in volume are all parts of what gives live music its pronounced impact. The single best feature of a Lowther is the sound detail it is capable of reproducing.

The basic Lowther design features a 20cm (8 in) twin cone driver. This twin-cone combination, coupled with an exceptionally strong magnet and a very light cone enables the driver to reproduce the full spectrum of audible sound and beyond. This unique construction has many advantages unequalled by any other speaker design!

Lowthers are one of the most efficient speakers in the world! With an efficiency of over 100 db from one watt at 1 m, a mere 3 watts will drive these speakers to more than realistic sound levels. As the driver is full range, no woofers, tweeters or crossovers are required. This gives a purity of sound that no other conventional speaker can match. Remember, no crossovers. So, no inductors, capacitors or resistors are in the circuit. You've gained a few dB in sound level already!

Only one Lowther driver is used per cabinet. The sound image is wonderful, compact, and aesthetically pleasing.

Also, don't forget that new Lowther single driver speakers take some time to "run in" and mellow out, just like a good red wine. Within 30 hours they'll smoothen out, after 500 hours they'll be run-in and then, after many, many years of service, they'll just sing.

The Lowther DX Series incorporates 'state of the art' magnet technology using powerful rare earth magnetic materials



The DX series of drive units employ 'state of the art' rare earth magnet technology. The magnet assemblies are extremely light and compact, yet much more powerful than any conventional magnets. Lowthers' all-powerful magnet assemblies allow the diaphragms to reach acceleration rates well beyond the capability of other, more conventional magnet systems.

The effect that such powerful magnet assemblies have increases the speed of the cones, and they also produce a high degree of damping. This results in an exceptional transient response, but with the oscillating factor reduced to an absolute minimum. The amount of information now obtainable from the recorded source is

truly remarkable. If it is on the recording then it will be heard. And, as it will be heard, it can now be fully enjoyed. No detail is missed and no degrading of the signal will occur due to unwanted coil oscillations while using these high efficiency speakers.

It is true to say that never before has it been possible to achieve such a quality of sound reproduction. The DX series Lowther speakers achieve realism in their sound reproduction that has to be experienced to be believed. Perhaps the most remarkable feature is the very compact size and light weight and yet with a magnetic power which is 10 times greater than is possible while using conventional magnets.

Power and Sensitivity

The sensitivity of a speaker (often expressed as a "dB" figure) is how loud it will play for a given power input. The usual (and proper) sensitivity rating is given as so many dB at one meter distance with 2.83 V playing into 8 Ohms (dB/2.83 V/1 m). 2.83 V into 8 Ohms is exactly 1 Watt of power, so sometimes sensitivity is given as dB/1W/1m. The driver sensitivity will usually not be the final sensitivity of your overall speaker system (including enclosure). Often, an enclosed space will add some sensitivity to the loudspeaker.

Single driver speakers are often more efficient than multiple drivers because of the lack of crossover. A passive crossover eats up power (how much depends on the complexity and value of the crossover components).

Generally, my minimum recommendations for speaker sensitivity are as follows:

3 watts or less - 100dB minimum sensitivity

8 watts - 96dB minimum sensitivity

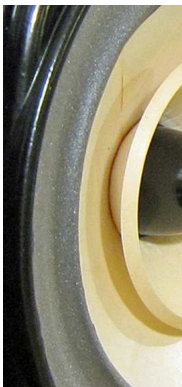
15 watts - 92dB minimum sensitivity

25 watts - 89dB minimum sensitivity

These are general guidelines and can vary by 2dB, depending on the impedance of the speaker, the type of music listened to, the size of the listening room and how loud you like to listen to your music. With sensitivity between 98dB and 103dB, Lowther 8 inch drivers are the most efficient in the world. A good enclosed space will easily add another 2-3dB for over 100dB sensitivity that will make even the lowest power amplifiers sing.

Lowther driver construction

Lowther drivers come in three types based on the kind of material used to construct them, they are: Alnico magnet (A series), Ferrite magnet (C series), and neodymium magnet (DX and EX series). DX2, DX3, and DX4 are the new neodymium magnet drivers. The neodymium magnet material is less costly to make than the alnico and is also smaller and lighter for a similar magnetic strength. This is very important since heavy magnets such as Alnico magnet (A series) require rotation of drivers in the cabinet every six to nine months in order to prevent improper functioning!



Lowther's DX range of drive units use the same cone and coil technology as the "C" series, but they make use of a new Rare Earth magnet system to produce very high levels of magnetic flux from very small magnets. The smaller Neodymium magnets give a smaller reflected wave than the larger "C" range magnets, while giving a higher flux density. Both of these Lowther drivers help to give a faster, cleaner and sweeter sound. The smaller magnet also reduces

the change of movement within the gap of the voice coil. With many of the very large magnets, the frame can become distorted due to the mass of the magnet forcing the basket of the speaker.

Using the latest construction methods, the inner cone is now isolated from the outer cone. This is not readily visible, but what is noticeable is that the rim of the inner cone ends with a reverse roll. Where once sound frequencies cancelled each other out and information was lost, now all that information is retrieved and can be enjoyed. Accordingly, making for a very high efficiency speaker. Whereas sound frequencies were once reinforced by the two cones working in unison at certain frequencies, now there is no over-forward sound reproduced.

The Lowther DX series tends to sound a bit warmer and more midrange-forward than the classic Lowther sound. For most people that makes them easier to listen to. Of the DX series, the DX3 is the best compromise between performance and price. With a powerful magnet rated at 2 Tesla and excellent 98dB sensitivity, the DX3 is a stellar performer and possibly the best value for money in the entire Lowther line. On the other hand, DX4 is probably the best full range driver currently produced. Many people describe it as providing the best of both worlds: Alnico magic coupled with the Neodymium's power and low weight keeps them performing for a long time.



Lowther 8 in drivers

Models	DX3	DX4
Overall diameter	23.2 cm	23.2 cm
Overall Depth	7 cm	8 cm
Voice coil impedance (nominal)	8 ohm	8 ohm
Minimum impedance	7.2 ohm	7.2 ohm
Magnet type	"NON-HiFerric" TM Rare Earth	"NON-HiFerric" TM Rare Earth
Flux density (1 Tesla=10,000 gauss)	2.0 Tesla	2.2 Tesla
Diaphragm	Twin-paper	Twin-paper
Frequency response	30 Hz - 22 kHz	30 Hz - 22 kHz
Nominal air resonance	36 Hz	36 Hz
Sensitivity at 1m/1kHz/1watt	98 db	99.5 db
Maximum voice coil travel	± 1 mm	± 1 mm
Total Q Factor	0.247	0.249
Electrical Q Factor	0.22	0.22
Mechanical Q Factor	3.11	3.11
Effective Moving Mass (gram)	11.5 g	11.5 g
Shipping weight	2.5 kg	3.0 kg

Lowther also makes 5 inch versions of their larger siblings. For example, the DX55 5 in. model shares the technology with the DX3 which is the 8 in. model. Similarly, the DX 65 is based on DX4 technology. Although smaller drivers obviously can't match the bass response of their larger siblings, they have excellent midrange and high-end qualities. Magnets with a similar strength can produce wonderful results when all their power is applied on a smaller diameter cone. Teresonic uses both DX55 and DX65 drivers in Magus speakers.

The Magus family's latest addition is a model based on A55 (Alnico) drivers. Alnico or AlNiCo magnets are largely comprised of **Al**uminum, **Ni**ckel, **Co**balt, and Iron, with trace amounts of other elements used to tailor the alloy's magnetic and mechanical properties.

Lowther 5 in. drivers



Model	DX55	DX65	A55
Overall diameter	17.4 cm	17.4 cm	17.4 cm
Overall Depth	7.2 cm	8.6 cm	11 cm
Voice coil impedance (nominal)	8 or 15 ohm	8 or 15 ohm	8 or 15 ohm
Nominal impedance	8 ohm	8 ohm	8 ohm
Minimum impedance	7.2 ohm	7.2 ohm	7.4 ohm
Nominal Power Handling	100W	100W	100W
Magnet type	"NON HiFerric" TM Rare Earth	"NON-HiFerric" TM Rare Earth	Alcomax 3
Flux density (1 Tesla=10,000 gauss)	2.0 Tesla	2.2 Tesla	1.98 Tesla
Diaphragm	Twin-paper	Twin-paper	Twin-paper
Frequency response	80 Hz - 22 kHz	80 Hz - 22.5 kHz	80 Hz - 22 kHz
Nominal air resonance	80 Hz	89 Hz	96 Hz
Sensitivity at 1m/1kHz/1watt	94 db	95 db	93 dB
Maximum voice coil travel	± 1 mm	± 1 mm	± 1 mm
Total Q Factor	0.191	0.202	0.298
Electrical Q Factor	0.22	0.22	0.346
Mechanical Q Factor	1.355	2.236	2.028
Effective Moving Mass	4.623 g	4.623 g	4.623 g
Shipping weight	2.5 kg	3.0 kg	4.0 kg