Raidho acoustics

Ceramix Drivers

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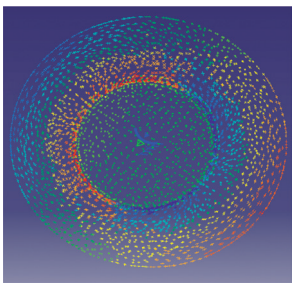
Raidho Ceramix Drivers.
Raidho Acoustics has set path to develop the ultimate driver for loudspeakers. Looking at the driver market today one can see that not much has changed over the last decade. The vast majority of drivers are fitted with soft and damped membranes to create an even and harmonic frequency response.
While this creates a driver with a nice even frequency response it also creates a driver with a wailed sound as some of the SPL is created from membrane breakup and phase outs. To Raidho there was little doubt that the ridged piston cone approach was the only right path to take in order to make the best possible Raidho dynamic Driver.

Cone Material
There's a number of ways to form a ridged piston type driver. The simplest and used by most manufactures is to use a metal cone made from pressed or spun aluminum or magnesium. One of the key issues in making piston drivers is to move the resonant peak of membrane breakup out of the pass-band where the driver is used. When looking at the typical 4-5" driver with metal cone, one will typically see a high Q breakup at app. 6.5KHz. By changing material properties the breakup can be moved more than an octave up to app. 12.5 KHz. The means to do so is the increase material stiffness by utilizing harder materials. The Raidho cone is made from a composite of aluminum oxide and aluminum metal. The composition is two skin-layers of 150 micron aluminum oxide separated by 100 micron aluminum. The aluminum oxide layer is formed in a plasma process where high voltages and currents are used to create a high temperature environment where aluminum oxide is gradually formed on an aluminum core. The plasma process runs for more than 60 hours to create the 150 micron layers on the Raidho membrane.



The Raidho Ceramix membrane has been subjected to extensive vibration research. Both geometry and materials have been analyzed with the finest FEM/FEA tools to create a membrane with a first fundamental breakup as high as absolutely possible. Analysis and measurements shows that the unloaded

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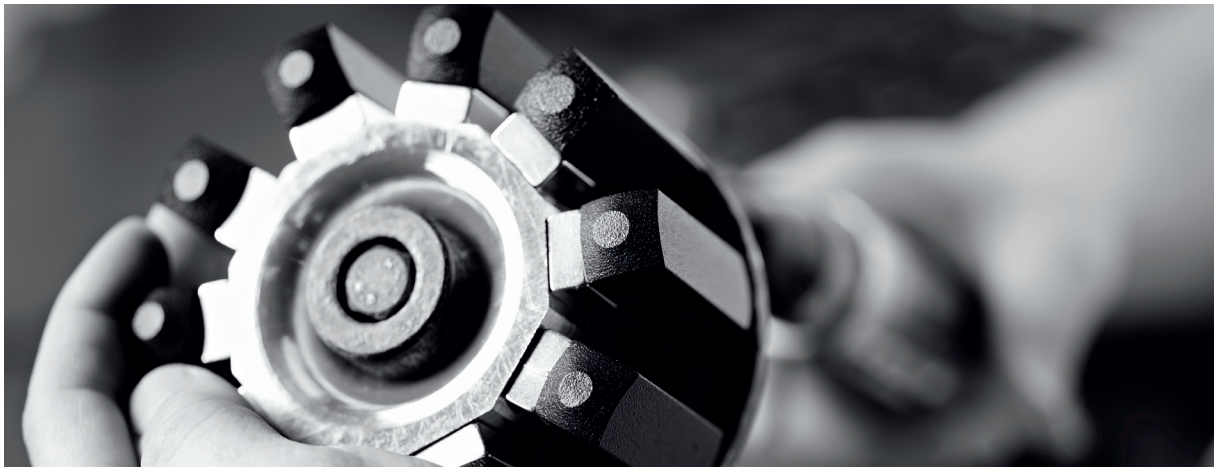

1.fundamental of the Raidho Ceramix membrane is app. 15,5 KHz. (4" membrane). This is then lowered by the mass added by the surround to app 12.5 KHz. On the frequency response the peak is a nice rounded bump of 3-4 dB at 12.5 KHz.

Cone geometry
Raidho has chosen to create traditional membrane geometry with a dust cap. This is done for multiple reasons. First the transition to the driving voice-coil is seamless and does not happened at sharp angles which in some instances can lead to cone breakage. Second it creates a more shallow geometry compared to the bowl shaped membranes of other ceramic cone drivers. This makes the Raidho Ceramix driver less prone to geometrical amplitude suck-outs. The driver is then easier to work with when designing cross over filters and entirely removes the need for crossover suction circuits.

The Raidho Ceramix Magnet system
No Driver is better than the magnet motor, yet magnet systems have hardly changed in the last 50 years or so. To Raidho neodymium magnets has completely changed the possibilities of making a more compact and acoustically ventilated (transparent) magnet system. The Raidho magnet system consists of two rows on neodymium magnets placed in a push-pull configuration. Apart from creating a very controllable flux in the magnet gab. The configuration creates a very open structure, where the rear side of the membrane is subjected to very little mirror effect from the faceplate of the magnet structure. One must realize that sound is transmitted from both sides of the membrane and that a solid thick face plate acts like a mirror bouncing sound right back at the membrane again. Measurements on soft membranes like paper and PP indicates that this mirror signal is only damped by app 8-10 dB compared to the original signal, by the ceramic membrane the damping is much higher and appears more in the nature of compression as partial membrane movements is not possible on a piston type driver. The patented Raidho magnet system allows air to move more freely and generates far less compression than any other magnet system on the market.
The sound improvement going from a traditionally built magnet system to the Raidho magnet system is huge.