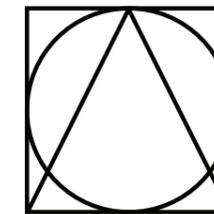


Technical Specifications

Technology	Advance Composite Technology (A.C.T.) cabinet construction Monocoque Tactic II advanced dynamic drive unit technology Semisphere Tweeter
Description	2 way, true linear phase, free space, ported enclosure, stand mounted monitor
Drive units	1 x 170mm (7 in) Wilson Benesch Tactic II bass unit / mid range unit 1 x 25mm (1 in) Wilson Benesch Semisphere Tweeter
Low frequency loading	Double reflex port tuning
Frequency Range	-6dB at 40Hz and 35kHz -3dB at 45Hz and 25kHz
Frequency Response	44Hz to 30kHz +- 2dB on axis
Sensitivity	89dB spl at 1metre on axis. 2.83V input
Impedance	6 Ohms nominal, 4 ohms minimum
Tweeter Filter	5kHz
Crossover	First order tweeter crossover Selected polypropylene capacitors and air cored inductors throughout
Internal wiring	Hand made loom comprised of military specification multi stranded, silver plated copper, PTFE jacket, soldered connections throughout
Input connections	Bi-wireable, in-house machined gold plated copper alloy terminals
Power handling	200W peak unclipped program
Maximum spl	118dB at 1 metre
Dimensions	Height 310mm / Height on stand 1050mm Width 230mm Depth 370mm
Internal volume	11.8 litres
Net weight	12kg (23kg with stand)
Finishes Available	Standard: Black, Regal Silver, Titanium Wood Satin: Natural Cherry, Maple, Oak Wood Gloss: Birds Eye Maple, Burr Walnut, Red Tulip, Red Birds Eye, Walnut, Ebonised Walnut, White Gloss



Vertex
geometry
series



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Geometry Series

The Geometry Series pays homage to the importance of geometry in all good design. With the Geometry Series Wilson Benesch applies these principles with passion to Acoustic Engineering.

Whether it be the curves in a musical instrument, a large auditorium, or an aircraft, geometry is the fundamental language of good design. The Greeks, who defined the rules of geometry, applied their geometric forms to Architecture. Curved Amphitheatres allowed public discussion long before any loudspeaker.

The Geometry Series aspires to be the evolutionary development of the time tested Odyssey Series that is now in its tenth year. This collection provides the summation of many years of considered thought and re-evaluation encouraged in part by new technologies and new manufacturing capabilities.

The Vertex

The Vertex is a 2-way highly optimised advanced materials technology stand mounted loudspeaker. Unlike many stand mounted designs, the Vertex and its stand, work in harmony to attain structural integrity, vital to the control of key components. Mounted with high tensile bolts, the speaker and stand become one. The cleverly engineered Vertex conceals and protects both the wire and crossover elements within the stand, avoiding all the problems associated with conductor and filter resonance, whilst also providing shielding.



The advanced carbon fiber A.C.T. monocoque, requires no additional bracing. Each element has been carefully selected and developed by Wilson Benesch, once bonded, each adjacent high performance element results in a mutual self damping. This complex hybrid construction is inaudible in a structure of this size. A unique advantage of this design, is that the air volume to cabinet size ratio is outstanding.

The high precision matching cabinets, manufactured using C.N.C tooling and advanced carbon fiber moulding techniques, are paired with powerful Wilson Benesch Tactic II drive units throughout. The Tactic II mid range drive unit is capable of remarkable transients that are never hindered by crossover parts. The control afforded by this design is limited only by the amplifier. Impedance characteristics are benign so low power amplifiers can be driven with aplomb.

The Semisphere Tweeter is the very latest innovation from Wilson Benesch. It is the result of many years of considered development that has been driven by a comprehensive critical evaluation of the finest technologies in the world, including the remarkable Sphere from Murata. The design incorporates advanced materials technologies that deliver extended high frequencies but without ever sounding un-controlled or sibilant. With moving mass components optimised to the lowest levels being driven by an ultra linear, high power, low profile motor you can be certain of outstanding transient response characteristics. Fastidious attention to detail continues at the voice coil termination, that has been reduced to a terminal free, single military specification wire connection from coil to terminal, removing any solder junctions that might compromise the micro detail, that is so essential to the function of the tweeter. The precision machined face of the tweeter designates both superb time alignment, whilst also presenting the ideal curved launch surface for the short wave lengths. The final assembly is housed within a massive housing, which weighs in at more than a kilogramme. When bolted to the polyalloy baffle and foot assembly, the whole system becomes one poly alloy, closed U beam of unyielding structural integrity.

Free of the noise commonly found in traditional loudspeaker systems the Vertex delivers a performance that is well beyond its dimensions, and is completely free of distortions that are simply unavoidable in conventional technologies. Immersed in music without distortions the listener will be drawn into the event like never before. Only the artist who composed it, and the musicians that interpreted it will be present at the event.

Tactic II

Thanks in part to our collaboration with Sheffield Hallam University, we have been able to draw upon both the academic expertise, as well as the most advanced analysis techniques to develop a new motor system.

Each iteration in the design has been modeled - prototyped, and then validated in an iterative process of improvement. This process of optimisation, ensures that every single line of flux is acting in a positive way and delivered precisely to the gap.

When compared to its predecessor, Tactic II sees almost 50% more magnetic force from the 10mm thick high quality rare earth magnet. Coupled with the fully optimised high iron content motor geometry the efficiency has been elevated by 3dB.

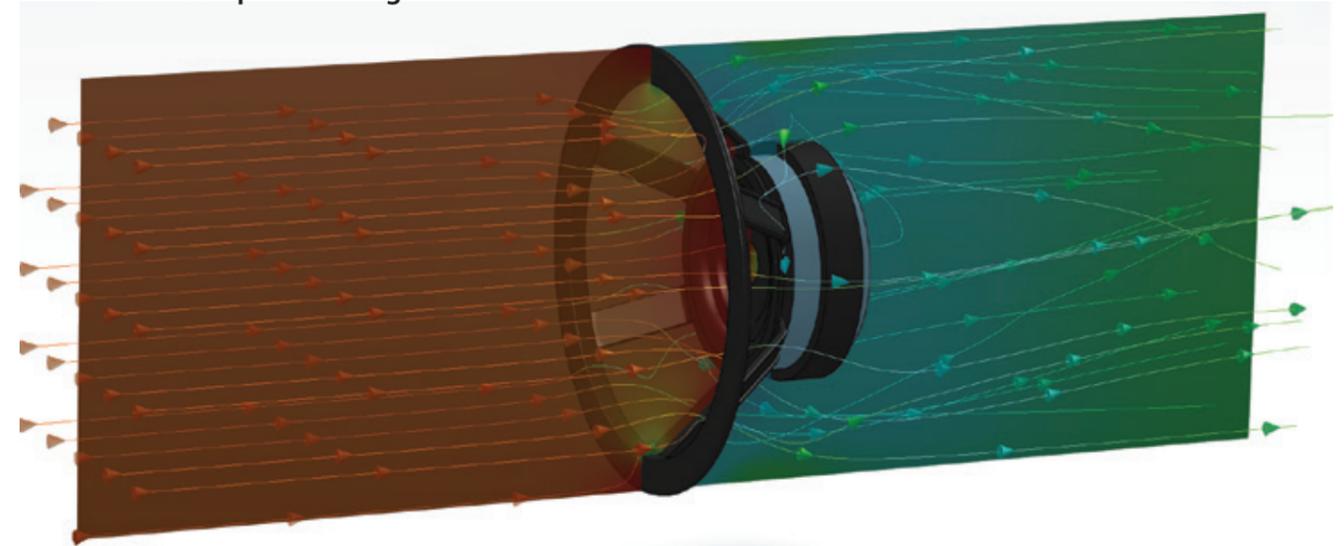
Due in part to superior inductance characteristics and 30% lower mass, the cleverly designed coil and former, delivers transient response characteristics that significantly outperform its predecessor. It should be remembered that this design was often described as "lightening fast" (What Hi Fii) by critics all over the world. These are a few of the improvements, that when combined, take the superb qualities of the Tactic to new levels, that are above and beyond what was previously possible.



Gas Flow Analysis Tactic II vs Conventional Basket

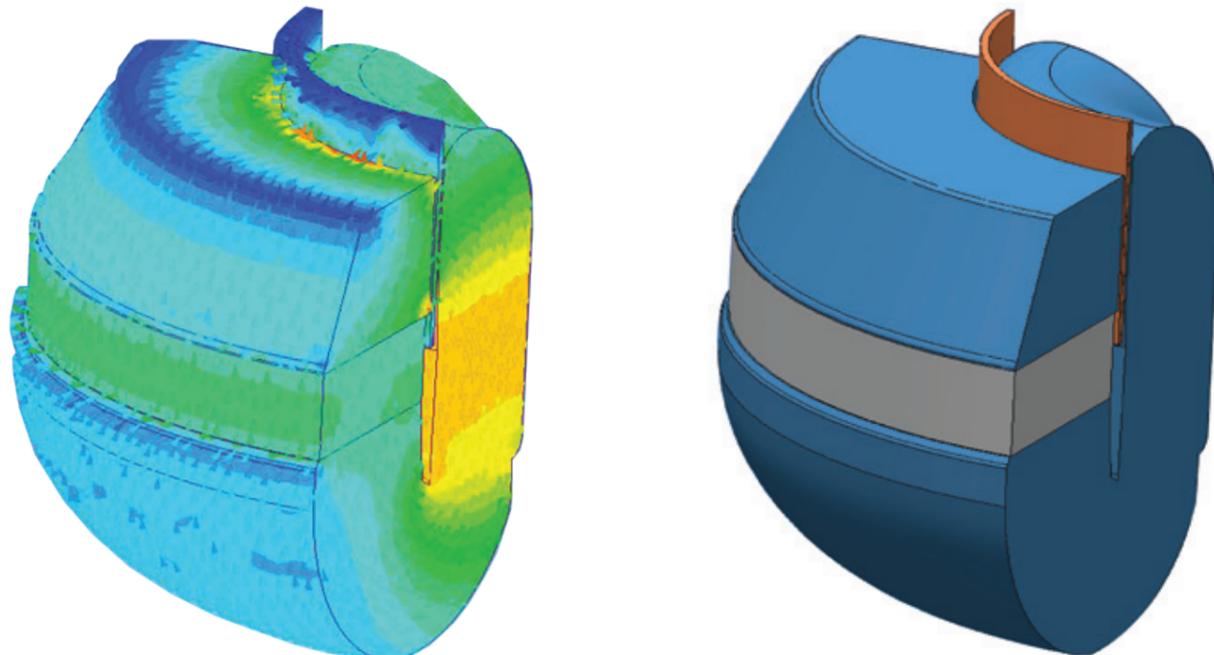
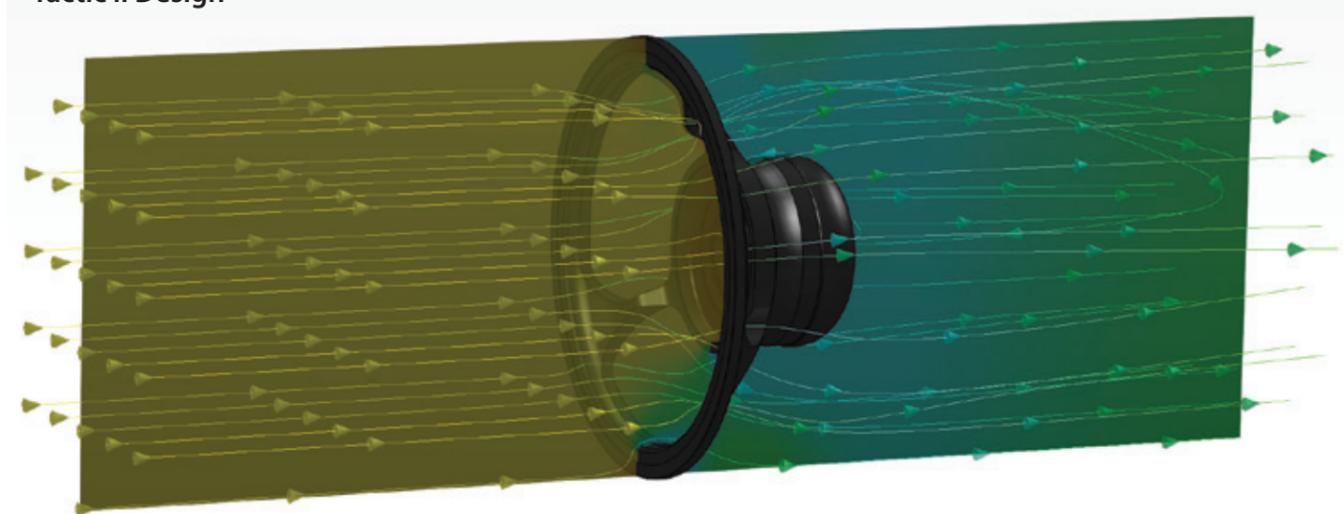
The following models present an identical simulation of gas flow over the more conventional speaker basket and the Wilson Benesch Tactic II basket. Our Engineers use the data in a similar manner that a Formula 1 Engineer might from wind tunnel measurements over a car. The simulation tells us how air movement, and therefore energy is managed over the basket. Simulations like these allow a scientific approach to our design.

Conventional Speaker design



The two graphics show the entire rear section of the basket has been subject to airflow from left to right. The plane cutting through the centre of each driver shows the relative air pressure in each. We can observe the pressure in front of the Tactic II (shown in yellow) is significantly less than the conventional design (shown in red), this imposes less pressure on the component, allowing the driver to function more efficiently to reproduce sound truthfully. We can also observe the path of the air flow having left the rear of the speaker basket. The air behind the conventional design experiences far more turbulence than the Tactic II. The implications of turbulent airflow become a consideration when attempting to manage energy in the speaker cabinet.

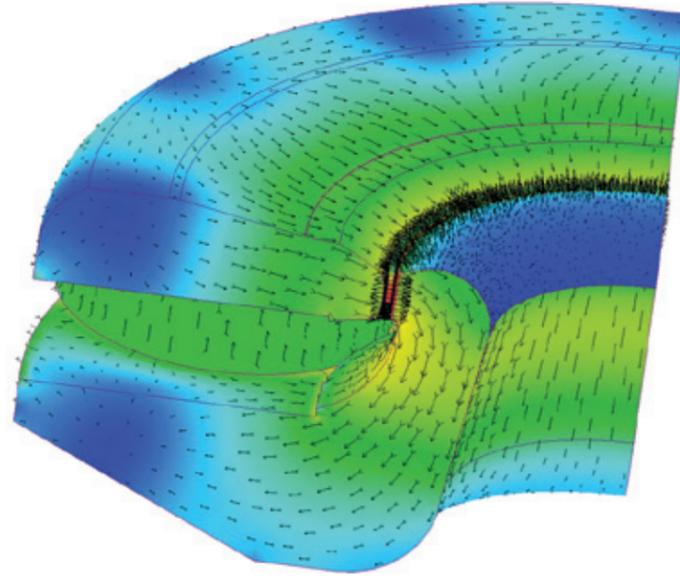
Tactic II Design



Wilson Benesch Semisphere

The Semisphere comes out of one of the longest developments in the companies history, dating back to the first drive unit ten years ago. It has grown slowly out of everything that we have learned from the best tweeters in the world, including the remarkable Piezo tweeter sourced from Murata, the Sphere.

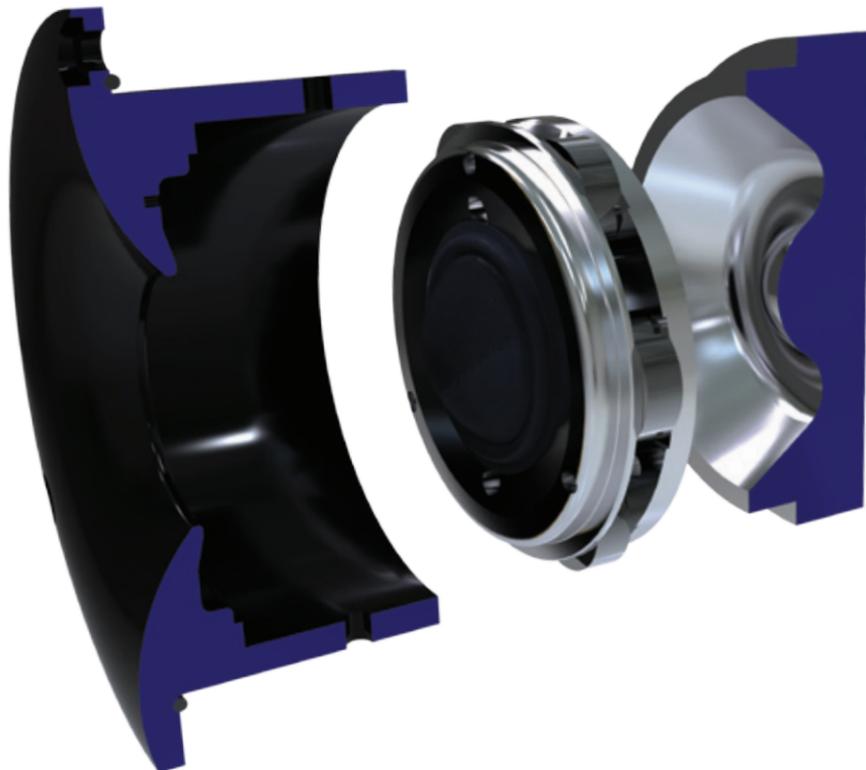
The Semisphere takes its starting point from soft dome technologies, where damping guarantees that the sound will remain clean and notable, without sounding hard or tiresome after a short period of listening. In every way the character is both natural and convincing.



Transient response characteristics are absolutely outstanding, thanks to the advanced materials technologies and their extremely low mass, that is almost one third that of the previous tweeter that it supersedes.

The dome is driven by one of the most powerful rare earth motor systems in the world. Careful attention to air flow, sees venting at both the side of the coil and rear, allowing any unwanted energy to pass unhindered into the huge silencing chamber.

The high mass of the system which is bolted to the alloy baffle ensures that the first resonance of the structure is close to 6000 Hertz. The tweeter alone weighs over a Kilogramme, but when coupled at high pressure to the poly alloy cabinet, the mass is huge, exerting a level of control over the sound of the tweeter that is beyond compromise.



A.C.T. Monocoque

The key benefit of the A.C.T. monocoque is the extremely low level of radiated energy. When designing a loudspeaker, the pursuit of stiffness can often conflict with the equally important need for damping. Stiff materials push up the first natural resonant frequency, while materials with high natural damping characteristics help to dissipate any unwanted resonances that do occur. The A.C.T. monocoque is totally unique in being able to set benchmark performance in both these key parameters. Created by Wilson Benesch over a decade ago, this Advanced Materials Technology is based upon a woven carbon fibre, combined with an arched geometry, and it remains the industry standard in performance.

The A.C.T. monocoque is highly complex being comprised of layers of energy absorbing materials. Carbon fiber has two key properties which set it above other materials for loudspeaker cabinets; extremely high stiffness, combined with low mass. The result is industry standard measurements in terms of first resonant frequency, giving carbon fiber an outstanding signal to noise ratio. Low frequency sound in particular, is extremely accurate. The first resonant frequency is above even the limits of the mid range drive unit, so the low frequency anti-phase noise is easily controlled. Not only is the sound that is radiating from the back and sides of the enclosure very low, it is also very close to the time constant of the original signal. This is due to the extremely high velocity of sound transmission that is typical of carbon fibre.

High frequency energy is also well damped by billions of carbon fibre micro-fibre, allied to the advanced core materials that you will commonly find in blast protection structures in aerospace design. The arched geometry of the monocoque structure, will govern that any high frequency energy that does radiate, will be perpendicular to the surface and so away from the listener. The structural integrity of the A.C.T. monocoque, ensures that the energy generated by the drive unit, is transferred to the air and not the enclosure, where it inevitably manifest itself as noise.

The graph shows the relative stiffness and damping characteristics of some common materials used in modern audio equipment. As can be seen the two properties tend to conflict, a particularly stiff material will not have good damping characteristics and vice versa.

Wilson Benesch has always engineered hybrid or composite loudspeaker construction. Each material with its own resonant signature mutually damps its neighbour within the loudspeaker assembly. This ultimately leads to each part being perfectly suited to make its contribution, whilst limiting resonances within the overall performance of the loudspeaker.

Material Stiffness vs Inherent Damping

