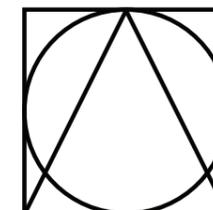


## Technical Specifications

|                              |   |
|------------------------------|---|
| <b>Technology</b>            | Advance Composite Technology (A.C.T.) cabinet construction Monocoque<br>Poly alloy hybrid design<br>Tactic II advanced dynamic drive unit technology<br>Semisphere Tweeter<br>Full metal bracing and baffle arrangement |
| <b>Description</b>           | 2.5 way, true linear phase, free space, ported enclosure, floorstanding monitor   |
| <b>Drive units</b>           | 1 x 170mm (7 in) Wilson Benesch Tactic II bass unit<br>1 x 170mm (7 in) Wilson Benesch Tactic II bass unit / mid range unit<br>1 x 25mm (1 in) Wilson Benesch Semisphere Tweeter  |
| <b>Low frequency</b>         | Bessel alignment of fourth order reflex. Double chamber differential tuning   |
| <b>Frequency Range</b>       | -6dB at 30Hz and 30kHz<br>-3dB at 35Hz and 25kHz  |
| <b>Frequency Response</b>    | 35Hz to 24kHz +- 2dB on axis  |
| <b>Sensitivity</b>           | 89dB spl at 1metre on axis. 2.83V input   |
| <b>Impedance</b>             | 6 Ohms nominal, 4 ohms minimum  |
| <b>Crossover Frequencies</b> | 5kHz  |
| <b>Crossover</b>             | First order bass roll-off<br>No crossover, directly coupled to the amplifier<br>Selected polypropylene capacitors and air cored inductors throughout  |
| <b>Internal wiring</b>       | Hand made loom comprised of military specification multi stranded, silver plated copper, PTFE jacket, soldered connections throughout   |
| <b>Input connections</b>     | Bi-wireable, in-house machined gold plated copper alloy terminals   |
| <b>Power handling</b>        | 200W peak unclipped program   |
| <b>Maximum spl</b>           | 118dB at 1 metre  |
| <b>Dimensions</b>            | Height 910mm<br>Width 230mm<br>Depth 370mm  |
| <b>Internal volume</b>       | 44 litres   |
| <b>Net weight</b>            | 31kg  |
| <b>Finishes Available</b>    | Standard: Black, Regal Silver, Titanium<br>Wood Satin: Natural Cherry, Maple, Oak<br>Wood Gloss: Birds Eye Maple, Burr Walnut, Red Tulip, Red Birds Eye, Walnut, Ebonised Walnut, White Gloss                           |



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Vector  
geometry  
series



### 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 Vector

The Vector is a 2.5 way, highly optimised, advanced materials technology, floorstanding loudspeaker. Thanks to the cleverly engineered A.C.T. monocoque / poly alloy shell structure, complex bracing is no longer accepted as a design compromise. The shell design delivers huge amounts of air volume, despite its small external surface area which is another key factor in the success of the design. Assembled by hand, each high performance material, is bonded to another high performance element, resulting in extremely high levels of mutual self damping. The resulting complex hybrid construction is virtually inaudible, exhibiting one of the lowest signal to noise ratios of any loudspeaker in the world, yet is capable of delivering all the dynamic energy from the ultra powerful drive units.

The degree of control that can only be found when every single component is manufactured in house, legislates that matching of both cabinet and drive unit is axiomatic. Manufactured on high precision C.N.C tooling and advanced carbon fiber moulding techniques, each hand built system, is lovingly assembled by highly trained experienced technicians, to the highest standards. 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. A quintessential design feature of all Wilson Benesch designs has been the 2.5 way crossover. This ensures seamless integration from the lowest bass to the highest mid range, with the absolute minimum of phase distortion. Designed to function in complete harmony the Semisphere Tweeter then takes over. This latest innovation from Wilson Benesch, 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.

Free of the noise commonly found in traditional loudspeaker systems, the Vector delivers a performance that is well beyond its dimensions, and completely free of distortions, that will always exist 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.

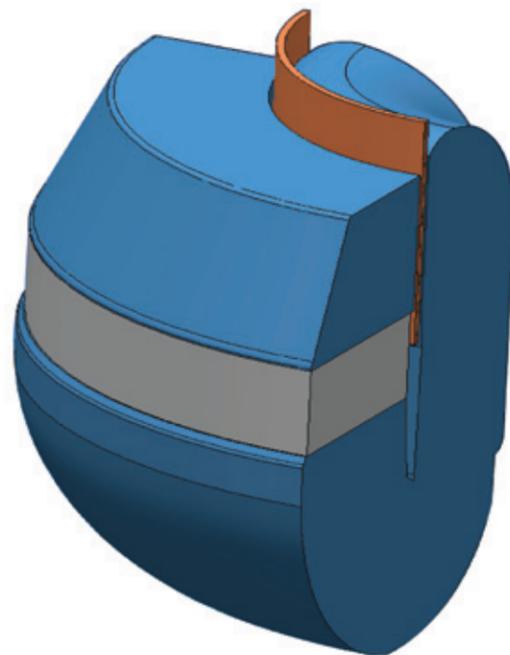
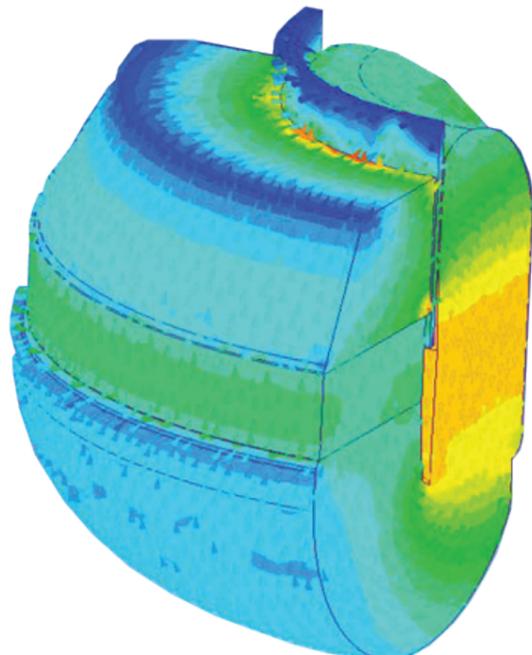
## Tactic II

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.

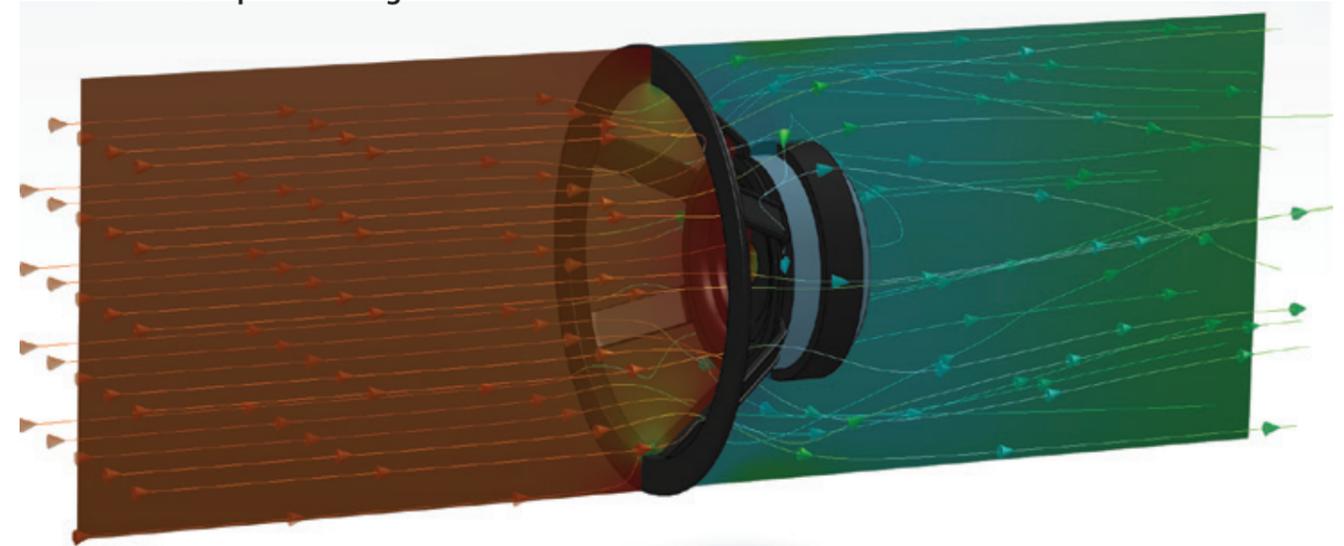
Due in part to superior inductance characteristics and 30% lower mass, the cleverly designed coil and former, delivers transient response characteristics that significantly outperform its predecessor. It should be remembered that this design was often described as "lightening fast" (What Hi Fii) by critics 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

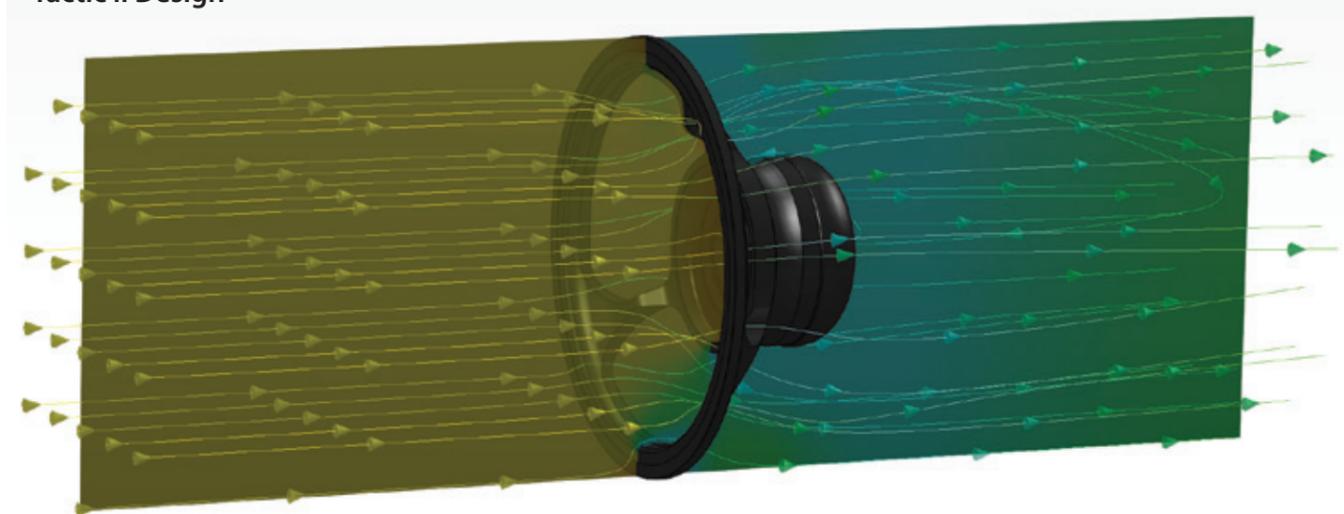
The following models present an identical simulation of gas flow over the more conventional speaker basket and the Wilson Benesch Tactic II basket. Our Engineers use the data in a similar manner that a Formula 1 Engineer might from wind tunnel measurements over a car. The simulation tells us how air 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.

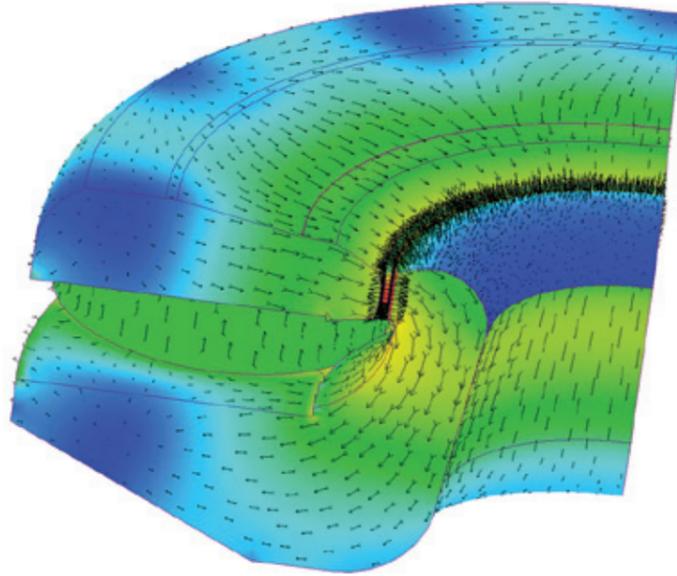
### Tactic II Design



## 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.

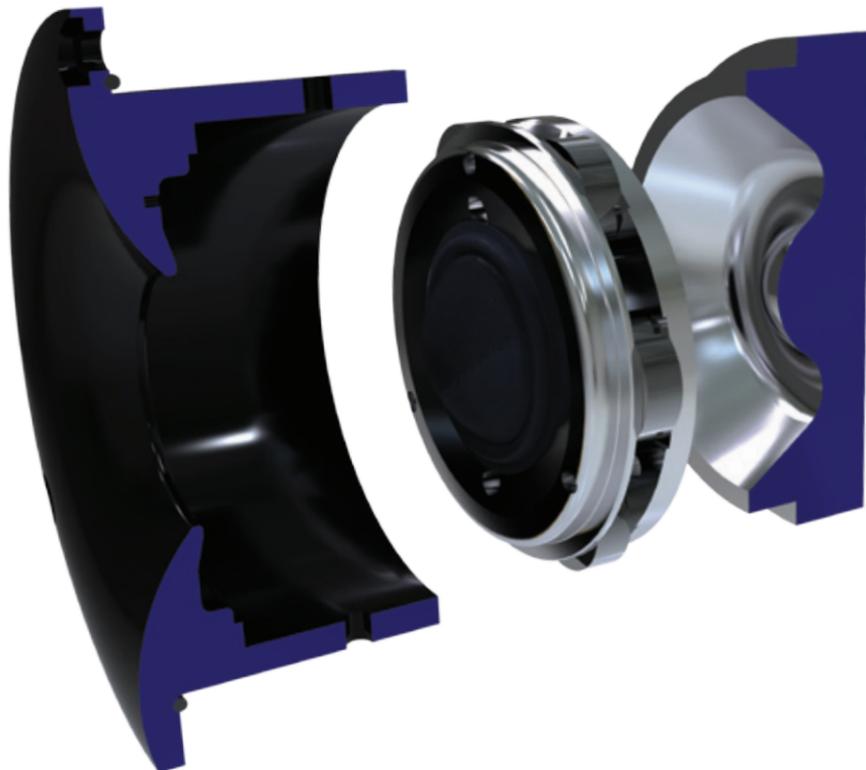
The Semisphere takes its starting point from soft dome technologies, where damping guarantees that the sound will remain clean and notable, without sounding hard or tiresome after a short period of listening. In every way the character is both natural and convincing.



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

