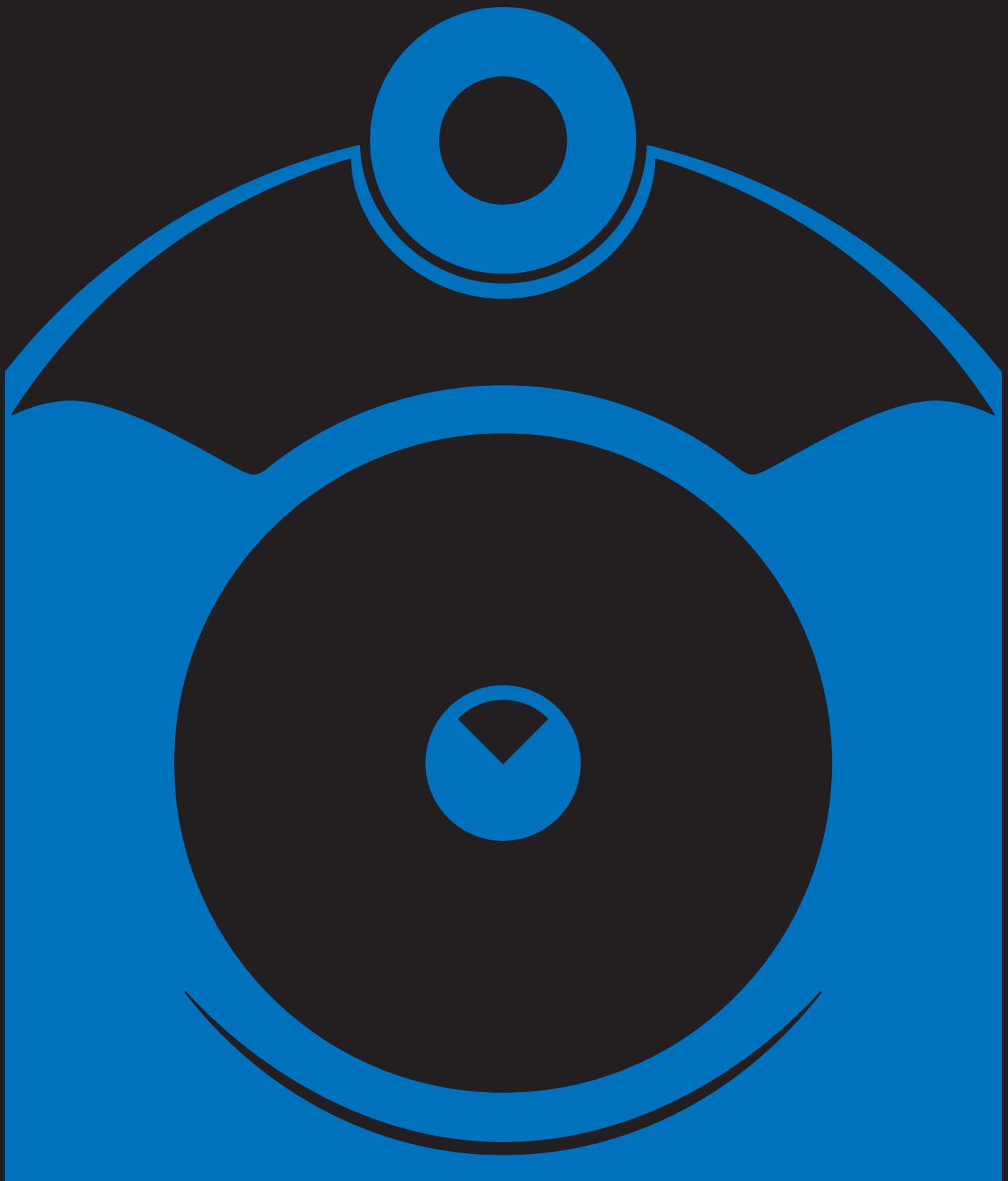
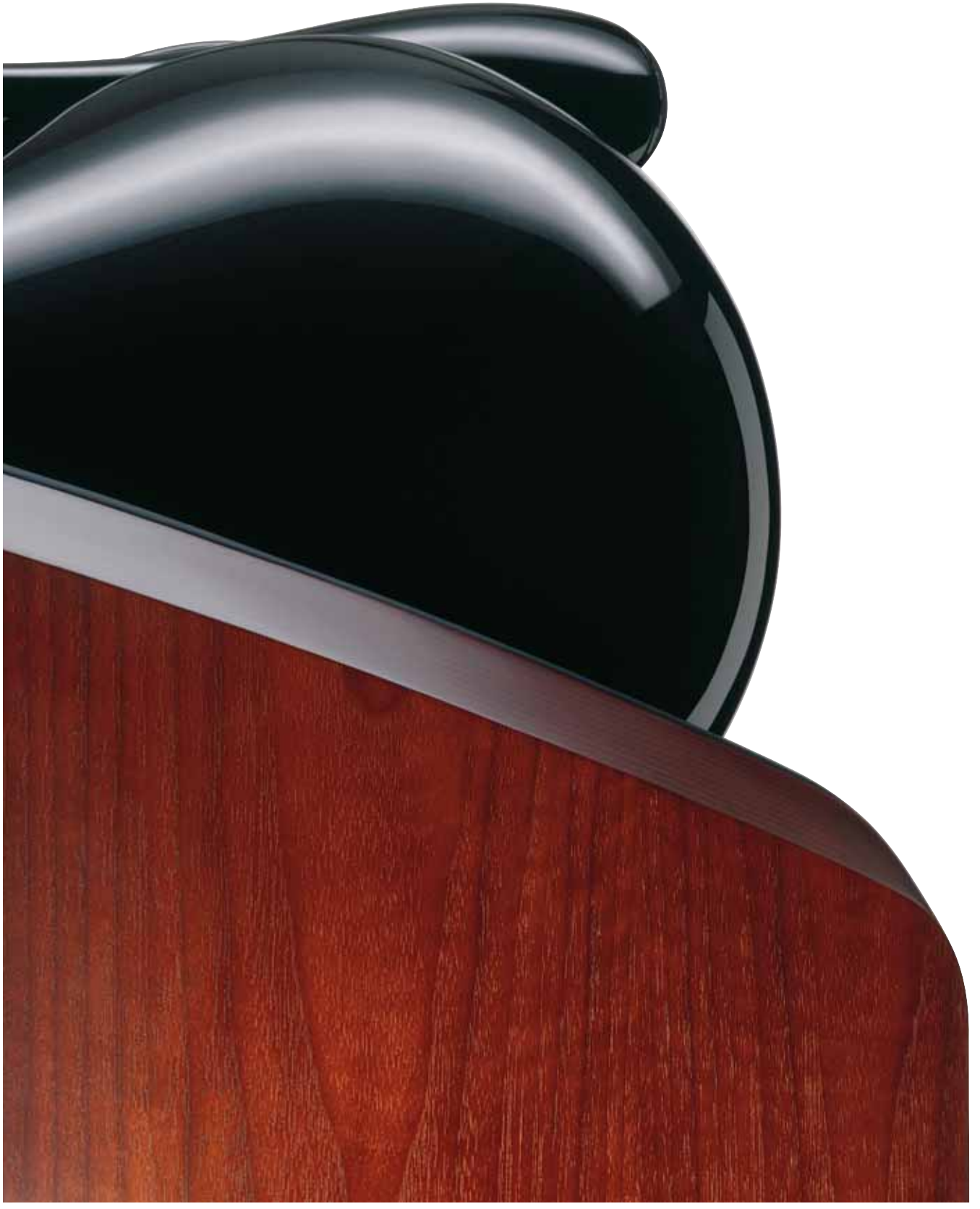
B&W Bowers & Wilkins

800 Series



Celebrating the 800 Series Everything moves on. Our enjoyment of music, for example, has undergone a revolution in the last few years. That album you thought you'd never hear again after the kids played Frisbee with it? It can now be downloaded in a full, stereo, scratch-free, digital format, within a few clicks of a button. Technology has made music more accessible. It's also made it more enjoyable. B&W's pursuit of the perfect loudspeaker has led to continuous improvements in the listening experience. A few years ago, our Nautilus™ 800 Series introduced advances in acoustic engineering that revealed music in a new light. But we didn't stop there. We kept moving on. We continued to refine and experiment, and now we've raised the standard again. We discovered the incredible difference made by a diamond tweeter dome. We've simplified the crossover to the purest, subtlest and most harmonious group of components. Improvements have been made to all the drive units. And we've widened the range to better encompass home theatre. You'll find a comprehensive choice of dedicated centre and surround speakers and subwoofers that blend both visually and acoustically with the core models. You'll find much more on these advances on the following pages plus interviews with well-known B&W enthusiasts and some stunning images of our latest creations. Finally, take a look at the DVD we've put together for the full story on how we keep everything moving on at B&W, by visiting www.bw800.com

www.bowers-wilkins.com



This is where it begins In leading recording studios around the world, music that will soon be heard everywhere is heard first through B&W 800 Series speakers.

At Abbey Road, the world's most famous studio, for example, recording equipment must offer nothing less than absolute definition and purity. In all three main studios, its Penthouse and its mobile units, Abbey Road employs the 800 Series to monitor the output of the most demanding artists. Recent releases by Coldplay, U2, David Gilmour, Michael Nyman, Groove Armada, The Thrills and Des'ree, amongst others, took shape here.

George Lucas is another standard-bearer for sound quality. 'Sound,' he says, 'is 50% of the motion picture experience.' Who are we to argue? The scoring stage at Lucas' Skywalker Sound studios in Marin County, California is where Hollywood puts music to hit movies. And they do it on the ultimate surround sound system, featuring B&W 800 Series speakers.

Dave Stewart uses B&W 802s at home. Here he talks about sound and music in relation to his remarkable career as songwriter, performer and producer.

What got you into sound in the first place?

I was about 9 years old and got given a tape recorder and it was one of the first portable mini reel to reels. That got me ecstatic about the magic of recording things and the fact that you could record something and playback reality ten minutes later. To me it sort of opened the door into a world of impressionism in a kind of audio way.

My father in his spare time was obsessed with carpentry and he made a radiogram, but he chose all these beautiful woods and the decks were separate from the radio. When he switched it on, we heard this amazing sound: a very warm, stereo sound in our living room. And although he was playing things like 'The Sound of Music' or 'Oklahoma' or stuff like that, the sound quality was incredible.

So there were certain points throughout my life where something happened that was like a big sort of stake in the ground like: Wow! Music can sound like that? And so through becoming a teenager and getting a record deal and then going into Basing Street Studios in Portobello Road and having my demos produced by Muff Winwood and going for the first time into a big control room. These were all building blocks in my addiction to sound. And so as the formats changed and as the techniques of recording changed there was one thing that always remained a constant with me which was: I don't really care how it's being recorded or you know what techniques and non-techniques are being used, I wanna hear the sound of how it feels.

How have changes in technology affected making music?

I have a record label that's a joint venture with Interscope in America and one of the artists who I signed is called Abdel Right. We made most of his album on a laptop in Jamaica in a kind of little room in a house and yet we mixed it in The Hit Factory. Yeah it [technology] has made a massive difference, but in a way it's like going back to the way it was: you can capture something, the essence of something and it's there forever. It has opened up a kind of Pandora's Box. For instance, this year I was recording with Shakira in Jamaica on a Gazebo on the water on a laptop and then later in the year I was recording with Mick Jagger in Abbey Road in the legendary Studio 2. And just now with some musicians here at my place we're recording in an old stable. So in all these different places you're capturing an atmosphere and the atmosphere of recording on the sea on a Gazebo with the waves all around you is in a way an important tool for song writing and capturing an emotional performance.

And how about changes in domestic playback technology?

There's so much paranoia connected to anything that creates a lot of wealth. And so when the internet first arrived and people were swapping songs and all that stuff, a lot of business people in the music business were like, 'Oh my God, got to control it; how do we stop it?'. But for me anything that gets people listening to music is a good thing. So iTunes came up with a way in which you can pay for music, download it onto an iPod and listen to it and everybody is quite happy to pay for it.

You see music, it's a funny subject to talk about because it's so emotional. For somebody listening on an old Dansette record player to a track by say Roy Orbison or Ray Charles, it might be the connection of that record with that Dansette record player: the sound of it actually connects to something to do with their past or their teenage years. On the other hand, people who listen to Pink Floyd's 'Ummagumma' or records that were recorded in, for those times, a quite sophisticated way with beautiful valve microphones; and then all of

a sudden there were speakers that could cope with all of the depth of sound, then that's a whole experience too and people loved to be enveloped in that as an emotional cocoon. I used to listen to Van Morrison's 'Astral Weeks' and I would spend 8 hours just listening: hearing for the first time how crystal clear that double bass sounds or listening to Hunky Dory and those string arrangements. And it was kind of mind blowing. These kind of moments in your life they hit something inside of you, in your spirit or in your soul and they stay with you for ever. And all of these new ways in which you can hear music, I think it's all good.

I don't really see it written anywhere or talked about, but the word universe means one song. And we're all meant to be singing it. Music is one of the few ways in which people are reminded that we are actually connected without having to speak or explain anything. You know I could sit on that piano and play a chord, say I'm playing A minor and I introduce a B, and everybody's emotion will shift because I've introduced that one note. Well that's a reminder to people that in the same way somebody can become slightly aggressive and everybody's emotions shift. Trying to get people to understand the true spirit that runs through all of us and links us together – that's one thing that music can do.

You do a lot of film score work now, like the music to the film Alfie. Is that very different to your other song writing?

Well it's a bit like what I was talking about earlier, it's based on a gut emotional instinct. Being with a person like Mick Jagger, or whoever I'm writing with, there's a flow of energy and I might hit a chord that strikes a chord within him and it makes him want to express himself or write something in a certain way. Now then you've got a third entity which is a movie which then has 25,000 other entities: how do you put all that together in one piece?

The movie Alfie is really what we were talking about earlier: a guy who was dealing with everything on a superficial level. All of a sudden it all comes crashing down on him and he realises, oh, there's a lot more to life than this and if I don't wise up you know then my life's over. And I was trying to sort of write a song with Mick or some chords that could go between minor and major, that sort of summed this up and Mick, being the unbelievable lyricist he is, came with one line that hit the nail on the head but it's not a line you would expect. And he wrote 'He won't let the love in'. He sings it in such an impassioned way. It's an amazing experience working with a genius like Mick Jagger. If you think right back to the early days and how young he was writing words like 'I Can't get no Satisfaction' or 'Sympathy for the Devil' or 'Get off of my Cloud'; if you analyse the lyrics they are so incredible.

What other projects are you involved with at the moment?

I'm writing and producing with lots of different people at the same time like Shakira, Gwen Stefani, and Anastasia's new album. Then I have my sort of personal, personal music. I've been working for three years with a friend of mine, he's called Mudbone – Gary Mudbone Cooper – and he was a singer in P-Funk, George Clinton's 'Parliament Funkadelic'. He's from Baltimore and he's a really inspirational singer. It's hard to explain his voice, but I'll give you some music so you can hear it (exclusively available on B&W's DVD). And we've been making this quite complicated fusion of like blues music and hip hop music, but it's got a bit of The Staple Singers to it. And we've really been carving it and creating it for no reason other than that we love it. We've just been playing it in the room next door. And, now we're slowly making these little one-off films just like home movies to go with each track, it's like a labour of love and whenever I've got a spare time, Mudbone and I get together and we sort of home in again. It's a bit like two guys who go down to a shed at the bottom of the garden and they're making a model aeroplane of something.

Dave Stewart uses B&W 802's at home. On the screen is an image from Dave's collaboration with George 'Mudbone' Cooper which is exclusively available on the B&W DVD.

High and mighty B&W tweeters go a long way up the frequency scale. But now we've pushed the bar as far as it will go by introducing tweeter domes of pure diamond.

Diamond
At Work™

Thanks to recently developed industrial processes, diamond can now be synthesised reliably in significant quantities, and in a variety of forms. It is a miracle material. Resistant to chemical attack, transparent to ultra-violet and infrared, an exceptional heat conductor and electrical insulator, its applications are growing fast. But the properties most commonly exploited – and which B&W has used to dazzling effect – are its remarkable strength and stiffness.

Diamond has been made artificially since the 1950s by subjecting graphite, another, less dense form of carbon, to extreme heat and pressure – in other words, simulating its natural production inside a volcano. But these conditions limit the size and shape of the components that it is possible to produce. Chemical vapour deposition (CVD) is a relatively new technique that allows diamond to be formed in complex shapes – such as tweeter domes.

Making a diamond tweeter dome is something like frost forming on a window – only the process uses carbon rather than water and is considerably more expensive. Gases are heated in a plasma to temperatures nearly as hot as the surface of the sun. Out of the gases the 'carbon frost' (diamond crystals) grow on a surface to form an ultra-hard diamond dome.

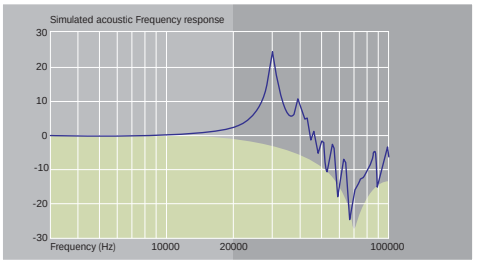
Virtually impossible to scratch, diamond can cut stone, machine metal and grind glass. Diamond surgical blades can be made many times sharper than traditional steel blades, thereby accelerating operations and the healing of wounds. Ultra-fine electrical wire is spun using diamond drawing dies, and oil and gas wells are drilled with diamond bits. But why use diamond for tweeter domes?

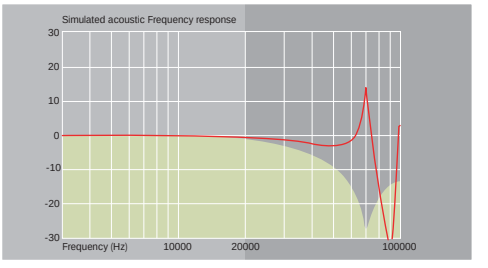
It may seem extravagant, but the move is simply an extension of B&W's pursuit of the perfect loudspeaker. One element of our quest for the best is the development of drive units that neither add nor subtract from the signal. In a tweeter, that means creating a dome that remains rigid, exhibiting perfectly piston-like behaviour, as far up the frequency scale as possible. Best for this are materials with a high stiffness to density ratio – which is where diamond comes in.

Over the years, B&W has optimised the design of its aluminium tweeter dome to raise its break-up frequency and bring about a cleaner sound. But the material that gets closest to the behaviour of a hypothetical perfect tweeter – one with infinite stiffness and zero mass that can only exist in a computer – is diamond. Working with the world's foremost industrial diamond producer, we've created the ultimate tweeter dome and the sweetest-sounding tweeter you've ever heard.

In the graphs below, we have simulated the performances of an aluminium dome (left) and a diamond dome (right). Simulation enables us to isolate the properties of the dome material from other variables that affect the response. In each case, the shaded area shows how a theoretically perfect dome with infinite stiffness and near zero density would behave.

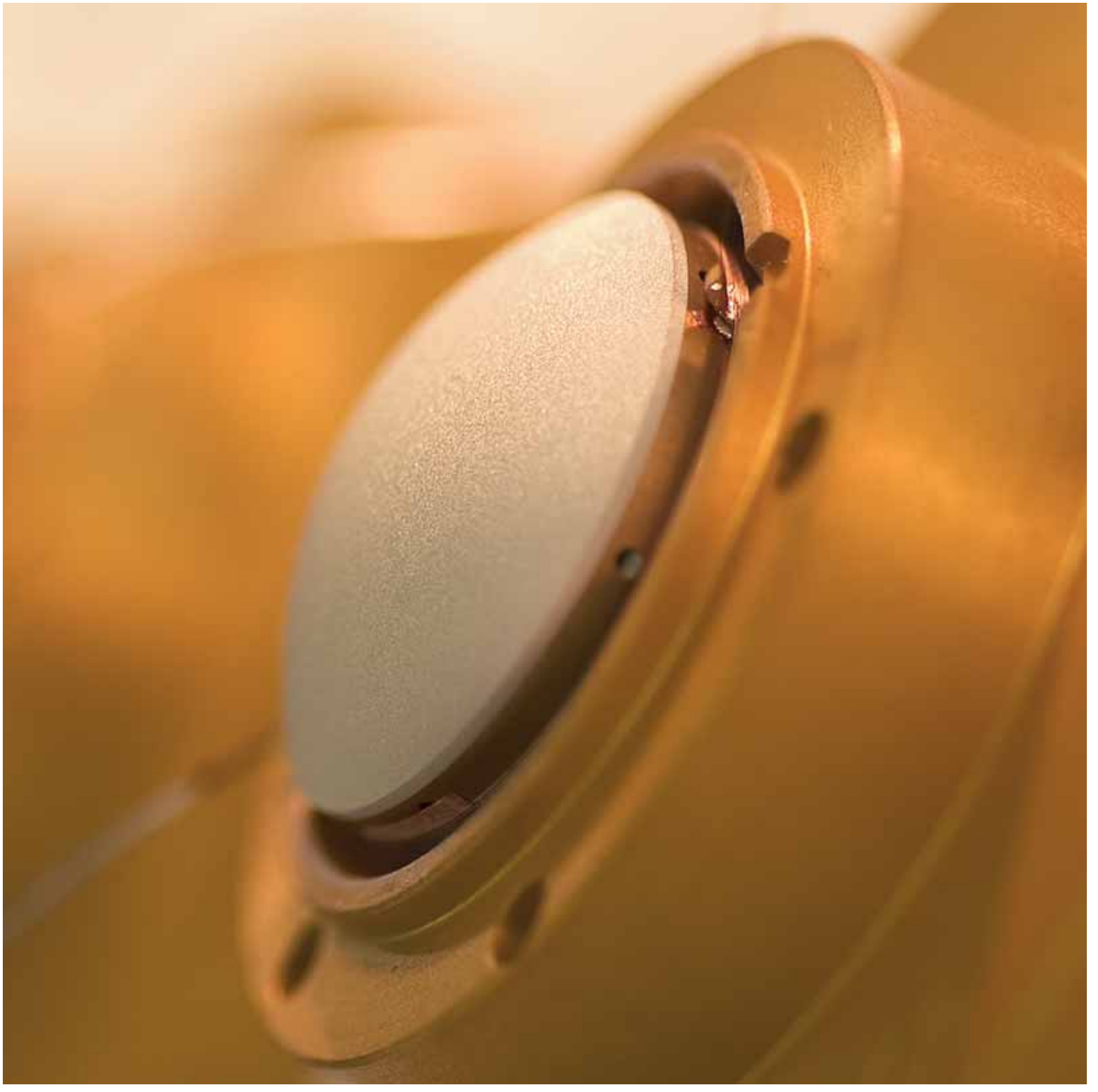
The response of the diamond dome follows the ideal precisely to 20kHz and more closely above. (NB The dip at 70kHz in the 'perfect' response is due to phase cancellation when the height of the dome equals half a wavelength.)





Of all the different types of drive units, tweeters are the most difficult to manufacture – the parts are more delicate and the tolerances finer. Now add the fact that the boundaries of performance are being pushed to the limit. Not only must advanced parts be used but they must be assembled in a controlled and precise manner. More so if that ultimate performance is to be achieved day in, day out, sample after sample.

For our diamond tweeters, we had to build a brand new assembly line. It uses the latest adhesive dispensing technology to ensure that the finest of beads can be applied accurately and consistently to minimise added mass, yet ensure a complete and reliable joint. The assembly jigs ensure precise alignment of parts – surround to dome, dome to voice coil, voice coil to magnet gap. Precision engineering guarantees that every speaker delivers to the full the promise of diamond.

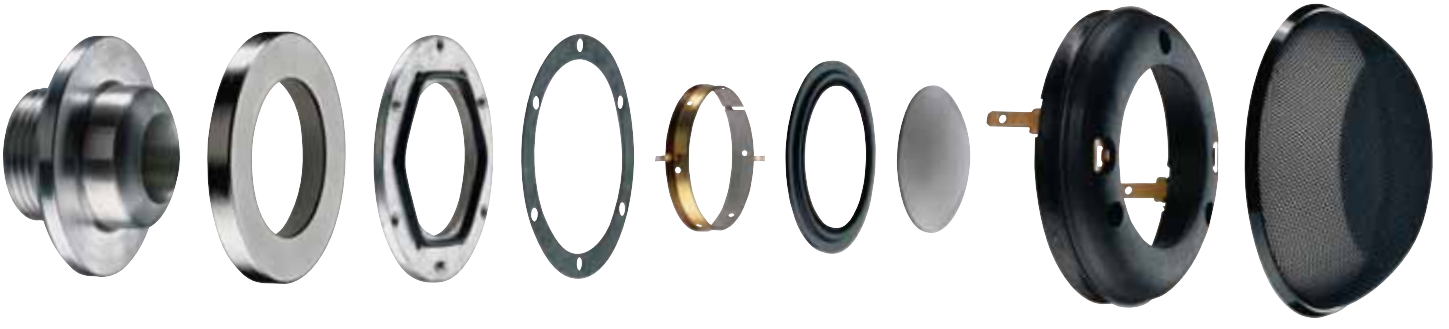


Behind the grille Creating the world's most advanced tweeter is not only a matter of developing advanced domes. 800 Series tweeters also benefit from a raft of other features to ensure these domes can perform optimally.

Preventing mechanical vibration from the bass cabinet reaching the tweeter leads to a much cleaner, sweeter high frequency performance. For the 800 Series, we've adopted a new synthetic gel to cushion the tweeter better than ever before. Not only that, we've also isolated the tweeter assembly from the tube and mounting behind, which reduces external interference to virtually nil.

When it appeared in 1970, B&W's DM70 loudspeaker caused a sensation in audio engineering circles. It was the first time we explored the benefits of separating tweeter or midrange drivers from the main bass cabinet. Looking more like pop-art furniture than a piece of hi-fi equipment, it featured a 12' bass driver in a curve-fronted cabinet. An 11-module, electrostatic midrange/high frequency unit hovered in a separate enclosure, better placed to provide a clean, untainted delivery.

The Design Council commended the DM70 for its groundbreaking approach. Germany's Funk Technik magazine called it 'a masterwork in the field of modern electro-acoustics and a milestone of development for the next decade'. Its success vindicated B&W's policy of research and innovation and ultimately led to the creation of the now world-famous B&W Research Establishment – aka the University of Sound.

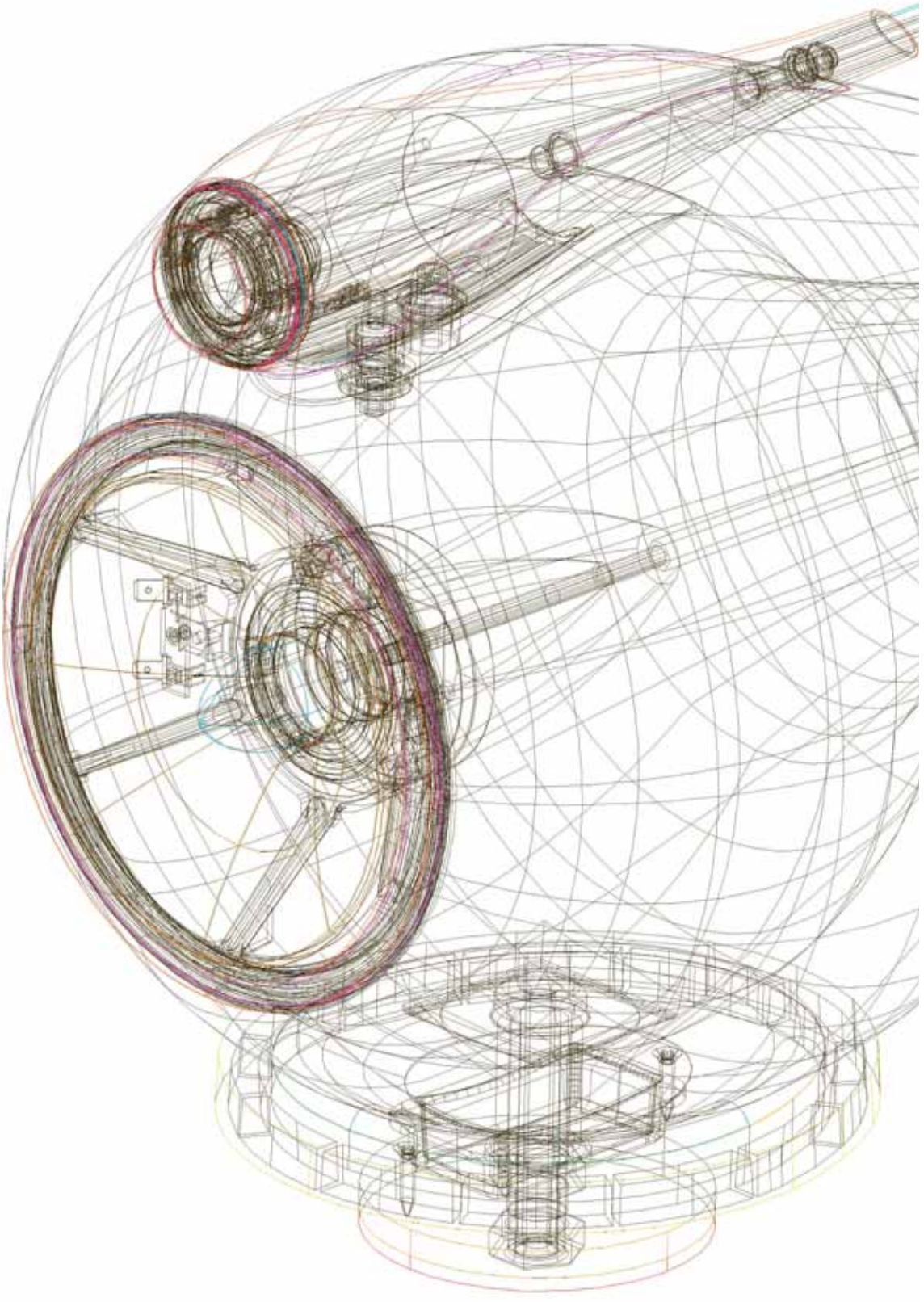


The tube-loaded tweeter that crowned speakers in the Nautilus 800 Series was a development of that pioneered by B&W's revolutionary Nautilus™ speaker. The concept hasn't changed a bit, but inside we've introduced a number of important refinements. First, there is the alternative on some 800 Series models of our ultimate tweeter dome formed of synthetic diamond, which gets even closer to ideal tweeter behaviour than previously possible, within and above the audible range.

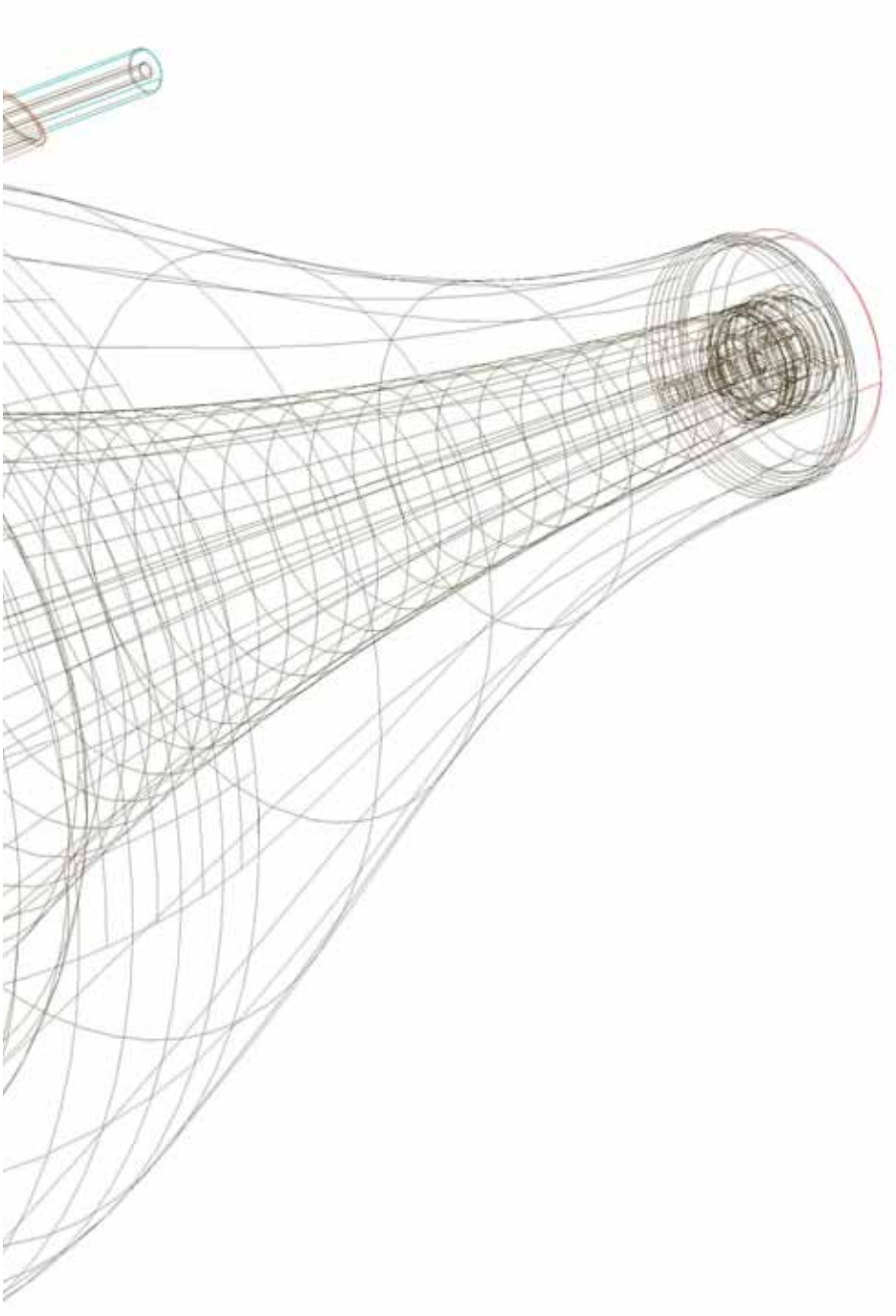
Next, for both metal and diamond tweeters, we have optimised the structural design of the assembly by silver-coating the magnet pole piece, lowering distortion and extending the range of both tweeter types. Finally, the use of an improved rubber formulation in the tweeter surround has helped to reduce traces of vibration and smooth the very audible bottom end of the tweeter's response, where it meets the response of the midrange. And if you're wondering why our tweeter's tubular, turn the page.

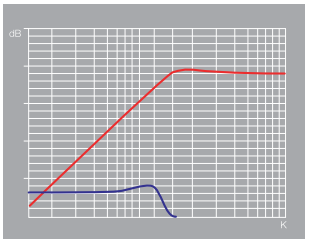
The sound of silence Not all sound generated by speaker drive units is good sound. The kind that emerges from the back of a working driver, into a conventional box cabinet, can bounce around and make a mess of the good sound coming out of the front. B&W's trailblazing Nautilus™ speaker found a way around boxes. Tapering tubes filled with absorbent wadding soaked up the wayward sound energy and reduced resonances to an insignificant minimum.

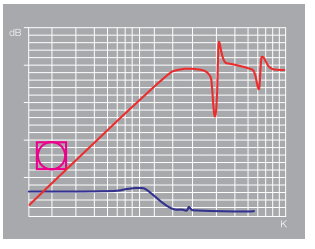
The tweeter on all 800 Series models follows the same lines. Sound is channelled through a hollow pole magnet, away from the diaphragm, and disappears into the tail. In the rigid, moulded head of the midrange enclosure, the chamber takes the form of a sphere and a tube, optimised using advanced computer-modelling techniques to silence sonic interference. So all the sound you hear is good sound.

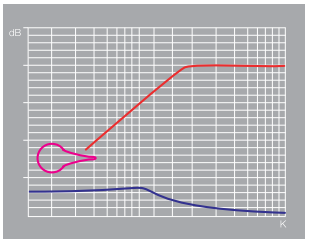


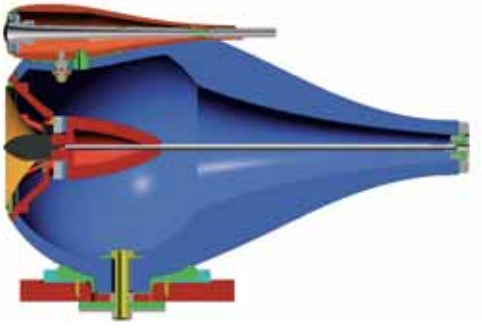
Graphically, in frequency response tests on midrange drive units, the difference between boxes and tubes is plain to see. The topmost plot below shows the theoretical ideal response: that of a driver with no cabinet. The graph in the centre charts the break-up of the response at high frequencies for a simple square box cabinet. At the bottom, the behaviour of the tube-and-sphere combination enclosure approaches the ideal, with little or no resonance across the frequency range.



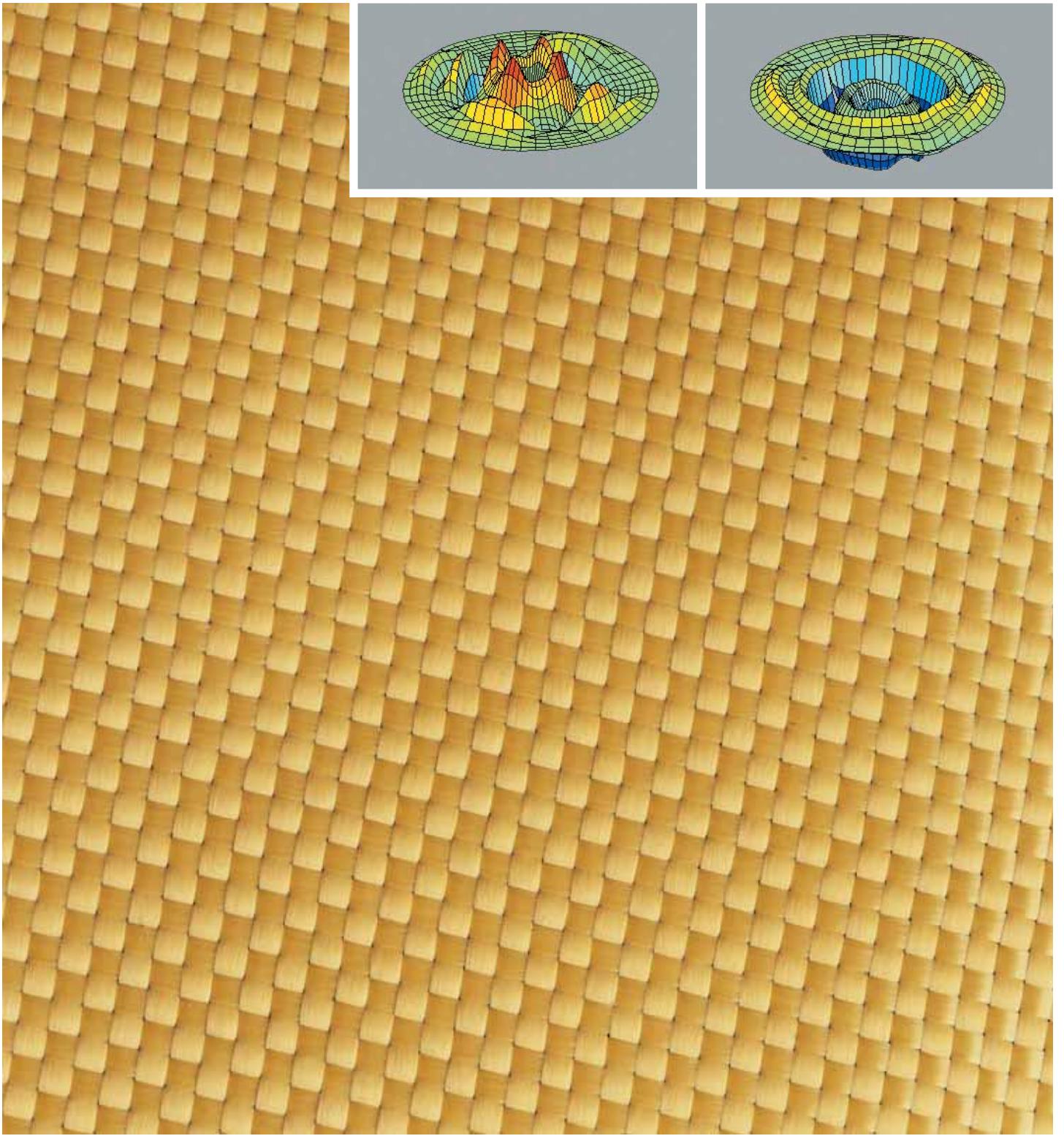








Dream weaving Waves and squares generally don't mix. Which is one reason why you'll find so few straight lines on an 800 Series speaker. But there is one component where square makes sense. The kind of homogeneous materials used to make conventional midrange driver cones are prone to the development of unwanted concentric standing waves. These can hamper the cone's performance. In the mid-1970s B&W was the first speaker manufacturer to employ Kevlar® in its cones – a lightweight, high-strength woven fibre used in bullet-proof vests, shrapnel-resistant shielding in jets and sports equipment. Kevlar's ability to improve resolution was traced by laser measurement to the square weave, which disrupted the formation of standing waves. Others have caught on to Kevlar®, but no-one has B&W's closely-guarded recipe for the resin mixture that enhances the material's strength and flexibility. In this 800 Series we've improved the recipe further to lower distortion and coloration even further.

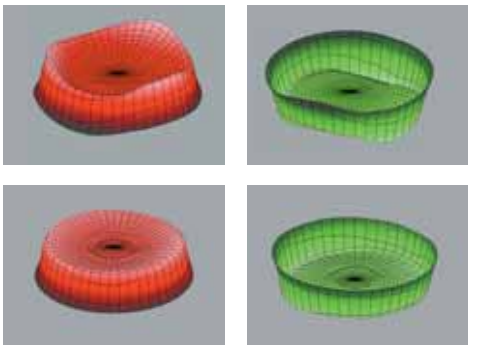


Bowers & Wilkins' FST™ mid-range drive unit maximises the effects of Kevlar® by improving cone response times and integrity of sound transmission. Surrounds both keep the cone in line and help to absorb bending waves. As the mid-range diaphragm only moves a little, B&W has improved outer edge cone termination by means of 'surroundless' suspension. A foamed material ring, with resistive mechanical impedance identical to that at the edge of the cone, is placed under the cone's edge. Bending waves travelling up the cone are almost totally absorbed by the foam ring, which also compresses sufficiently to accommodate cone movement at mid frequencies.

All our careful refinements of the Kevlar® cone would count for nothing if we didn't do all we can to minimise other sources of disturbance. Moving air behind the cone, for example. The chassis of the FST™ driver is designed to minimise any impedance to the flow of air from the rear of the driver. To reduce the clutter immediately behind the cone still further, we've adopted neodymium magnets, which deliver the same magnetic force from a smaller device.

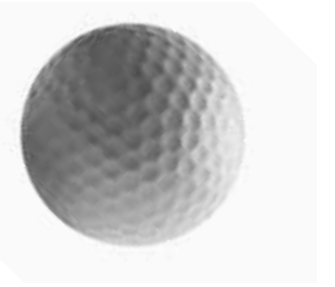
Massive You'll get rock-solid bass from the 800 Series, whether you're listening to Charlie Mingus, John Paul Jones or Robbie Shakespeare. Our bass driver, backed up by an imposing magnet/voice coil system, preserves the speed and 'slam' of the most demanding bass lines. The construction of the cone is critical. What we're aiming for is 'perfect piston' behaviour: the ability to move air with complete freedom while resisting deformation.

The cone must be as light as possible for maximum agility, but absolutely rigid in order to retain its shape as it pumps in and out. The material we've selected to do the job in the 800 Series can certainly take some punishment. Called Rohacell®, it's a sophisticated composite construction having a hard foam core, sandwiched between carbon fibre skins. It's the kind of material normally used for aircraft, rockets and performance cars bodies. So high air pressures are definitely not a problem. For speed, stiffness and unshakable bass, it's the bottom line.



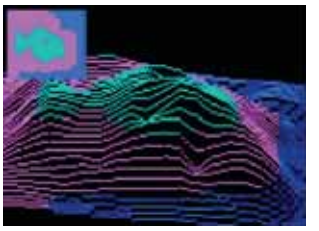
Streamlining Car designers go to a lot of trouble to make sure their vehicles slice efficiently through the air. If they don't, not only does turbulence reduce performance, it also increases wind noise. So it is with the reflex port in a loudspeaker cabinet. If turbulence occurs as the air moves in and out of the port, you'll hear extraneous noise and, as you turn the volume up, the bass won't be as tight and well timed as it should be.

B&W's Flowport™ minimises turbulence in the same way as a golf ball. Dimples on the surface generate tiny eddy currents over which air can flow smoothly and, above all, silently. It's a perfect hole. But don't use it for putting practice.



Outer stillness, inner strength Why are seashells round? Answer: edges and corners are potential weak points against the buffeting and banging of an oceanic existence. A continuous, curved surface creates a much stronger structure using the same volume of material. Forces from pressures and impacts are spread evenly across it. Similar mechanics are behind classical architecture's discovery of the arch and the shape of the wheel.

It's an ancient principle; it's just taken a while to reach the design of speaker cabinets. Fortunately, B&W's development of shell-like bass cabinets means the wait for the resonance-free enclosure is over. The thick, multi-layered wall holds the drive unit assemblies still and secure, and absorbs shocks and vibrations that might send straighter cabinets round the bend. As if a naturally strong shell wasn't enough, the cabinet walls are held firm against exceptional vibration by their own internal skeleton.



B&W introduced its Matrix internal bracing system more than 15 years ago and has been refining its design and construction continuously. A structure of interlocking panels works like the ribs in a ship's hull, defusing stresses and strains and bracing the cabinet sides against movement. Laser measurement (left) shows that while straight-sided cabinets flex and vibrate under heavy use, B&W's Matrix-braced, curved cabinets hold still.

A simple soul The parts of a speaker doing the hard, mechanical work – the drivers – act on the signals distributed to them by the electrical processing part: the crossover. The thing to look for is its simplicity. Some speakers demand complex crossovers to compensate for the shortcomings in their drive units. The better the mechanical design, the simpler the electronic design can be. That's why the 800 Series uses simple circuit design, with the crossover between the critical tweeter and midrange drivers being 1st-order – the simplest circuit possible. That simplicity, coupled with using components of the highest calibre, helps to retain the purity of the signal.

We are still working to understand fully why and how certain components influence the sound of a speaker. Different manufacturers' versions of nominally the same component will significantly alter the character of the sound. The only solution is to put our trust in our ears and to choose what sounds best. We carry out exhaustive listening tests rigorously assessing the performance of each component until we find the optimum component for each position in the circuit. For the 800 Series, we've taken the process a stage further, developing a new range of components with a world-leading capacitor specialist. The system's quality and simplicity play a fundamental part in the speaker's open, realistic sound.

Fine-tuning by ear is only possible if the crossover is simple. The section of the crossover that perhaps benefits most from our policy of listen-and-learn is the part handling the signal for the tweeter. The fragility and subtlety of the signal demands the most sensitive treatment, and in the 800 Series it is carried by a single, ear-chosen component that preserves the very finest detail.

Total Immersion Two-channel audio remains the benchmark for judging the sound quality of a speaker system, and it's where B&W's heritage lies. Home theatre has presented us with a new set of design challenges. For example, the centre speaker in a system has to deliver more than its fair share of film sound information – virtually all the dialogue, in fact. It's a role that demands the ability to handle power without compromising on clarity, within a cabinet that must remain compact and discreet enough to sit above or below the screen.

There are four centre speaker models that complement the 800 Series, from the HTM4S, which is essentially an 805S in a horizontal cabinet, to the HTM1D, which packs all of the attributes of the headed speakers into a cabinet that will still sit beneath a large projection screen.

The true test of any home theatre system is how well it manages to recreate the most three-dimensional, all-encompassing sounds in cinema: thunder and rain, the buzz of city streets, the earthquake tremor. And, since four floorstanding speakers presents an intrusion on any living space, the ideal surround is one that's compact and shallow enough to be fixed to the wall. For smaller rooms, the surround sound of four SCMS direct radiators will put you fully in the picture. A wider listening area with a larger audience might require DS8S speakers with the added option of dipole operation which, placed above head height, will diffuse detailed, dynamic movie sound evenly throughout the space.

Depth of feeling In the best home theatre set-ups, sound becomes physical, and the movie turns into a more immediate, lifelike experience. The frequencies you can feel are the low ones, and their realism relies on an effortless, distortion-less delivery. That's what you get in spades, even down to the deepest, darkest reaches of the frequency scale, with both 800 Series subwoofers, the ASW855 and ASW825. Both boast a 1000W amplifier and a rounded cabinet to match the rest of the range. Inside, B&W's Matrix bracing and the heavy, curved walls soak up vibration, minimise panel flexure and keep the subs as still as a rock. Let sound take root. Choose from the ASW825, with 12in diameter cone, for smaller rooms, and the ASW855, whose 15in driver will make its presence felt in large spaces and beyond.

Concert pianist, author and poet, Alfred Brendel is one of the world's leading interpreters of music from the central European classical traditional, particularly by composers such as Haydn, Mozart, Beethoven and Schubert. His playing is considered uniquely selfless in its combination of both intellectual and emotional validity. Here he talks to us about how sound relates to his work.

As a pianist what does sound mean to you?

It is the gate to music. It is its sensuous body and soul. It is a condition without which music would not be. It means to me colour balances, tambour and of course pitch. It is something that one has to learn to listen to properly, which is difficult for young musicians. It can take sometime until they listen to themselves precisely. But nowadays they are helped by tape recorders, microphones and good speakers.

What organises sound and make it become music?

Sound is organised by written melody, harmony, polyphony, but there is also form and psychology or in other words structure and character.

And when you talk about character what do you mean?

It's a good question because quite a few musicians have asked me the same. It is something that is not necessarily implied in the structure of the piece. To grasp form and structure you just need the ability to do it on musical and technical terms. The grasp of character needs additional psychological skills. When I say character I mean something like what people notice when looking at other people. They differ in having certain qualities, abilities, possibilities.

First of all you have to be interested in the matter. My observation is that some musicians are not. Or that they think that they get the character ready made from the piece. There are characters which are relatively easy to spot like funeral marches or lullabies. I would think that some Beethoven's Adagio in a minor key has not often been mistaken for a humorous piece. On the other hand, humour in music is often not recognised, because of the prejudice that music should always be mysterious and elating. Or simply because of a lack of humour in the performer. It can make a big difference whether a piece like Beethoven's 'The Diabelli Variations' is seen as sternly serious or basically humorous.

In what way can listening to playback teach the pianist to more precisely notice what he's doing?

Well it all depends actually on the quality of everything involved. It starts with a really good piano in good condition. It needs the best technical equipment. It needs speakers that give the right balance of sound. I mean speakers that do not become piercing or thin out in the higher registers and booming in lower registers. Speakers that give an overall sound which is warmly detailed without being clinical.

Going back to your point about good speakers. Your recordings can be played anyhow, anywhere on any kind of speakers, does this worry you?

It sometimes certainly does because of course there is a dependence on certain types of recordings that should be played on a certain quality of speaker. There are some very happy recordings which sound good almost anywhere, but this is more the exception than the rule. But it's not only the speakers of course, it is the room in which you listen. It's a rather complex matter and it has become more complex in the last ten or twenty years. It was much simpler in the 1970s when, to my ears, some of the best piano recordings ever were released. Wonderful sound of Fisher's Bach or Chopin's 24 preludes from 1933/34. But it is not completely impossible to achieve this today. In fact I have asked my producer in one of my latest recordings to listen to Fisher recordings in order to get an idea of the beautiful focus of the sound which, in one piece, is not separated into something that is close and something that is far away, as it usually is these days. And I think the result was one of the best piano recordings that I made in terms of piano sound.

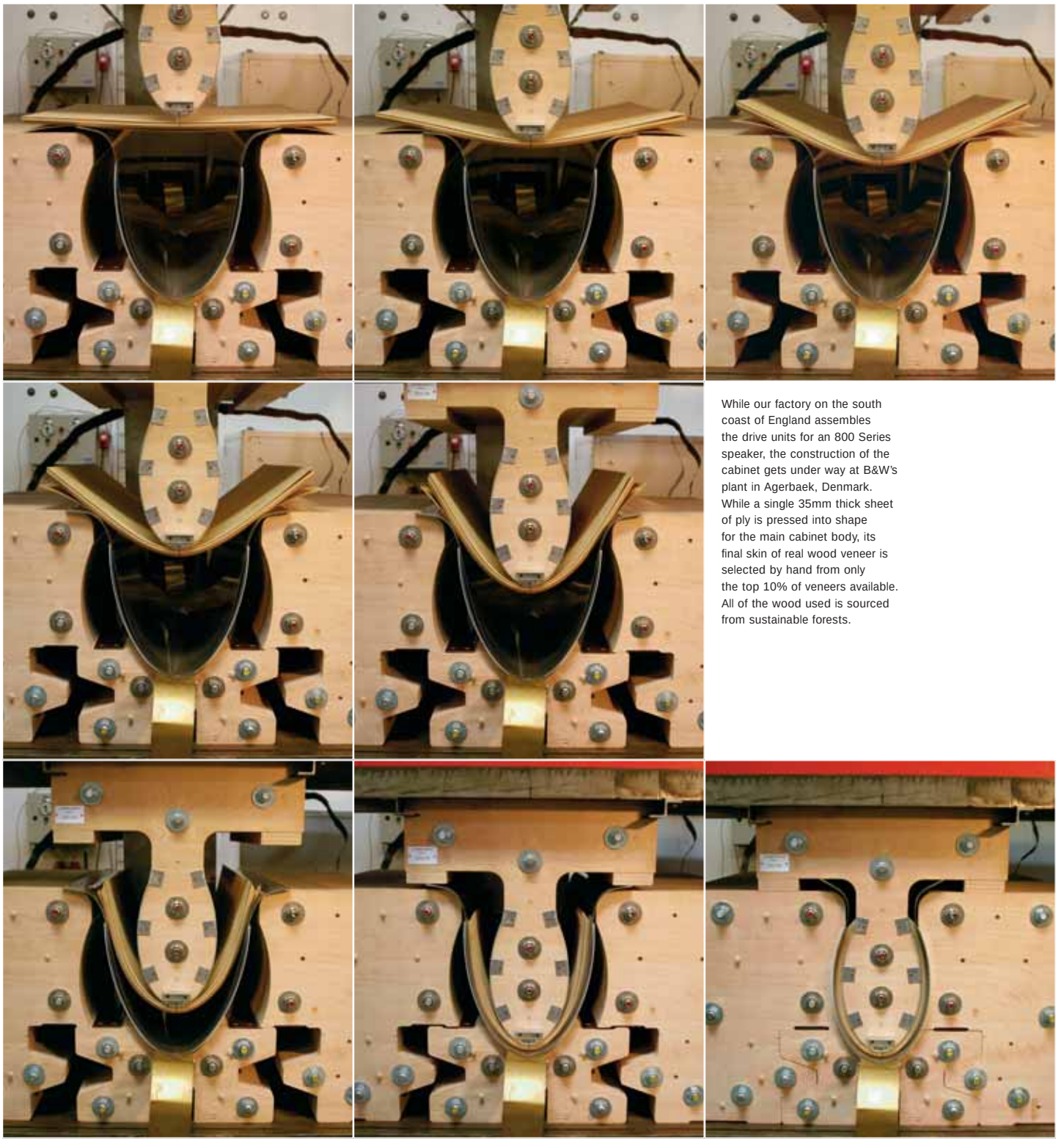
There are plenty of examples where noise has become music in 20th century works. Would you agree that the distinction between the two then has perhaps eroded over time?

Yes this is a good question. Of course some noise has been included in great music. Not to the detriment of it or at least not as long as it doesn't become too loud. And there we are touching an important matter. I think that quite a few younger people or people who go to the movies these days have lost the distinction between sound and noise. When sound gets too loud it becomes noise. And it is not only aesthetically dangerous it is a health hazard.

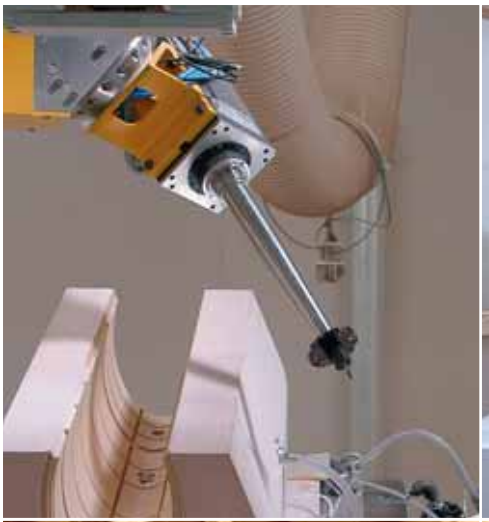
Perfection is an ever illusive ideal. How close did you come to this in your recordings? Is there an ideal sound?

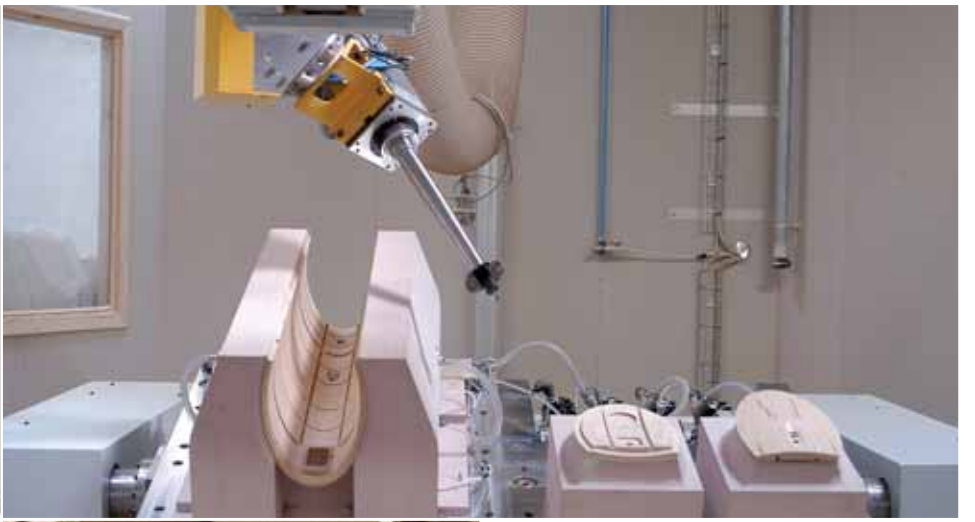
I have never been a habitual perfectionist myself. Of course I tried to do things as well as possible, but there is always more to do. In terms of recordings of course I am happy if things can come out as well as possible. These days, with the help of modern electronics, one can sometimes go on working on the sound later on to get it right. And that is one of the happy features of modern recording. It is sometimes also a matter of putting not your finger, but the finger of an engineer on one of those levers and moving it the slightest way that can make all the difference to the meaning of a performance. It suddenly comes to life.

Material differences Designing an 800 Series speaker is one thing; building it is quite another. Many of the processes that B&W uses to select, shape, treat and test our materials have been specially developed to create a unique final product.

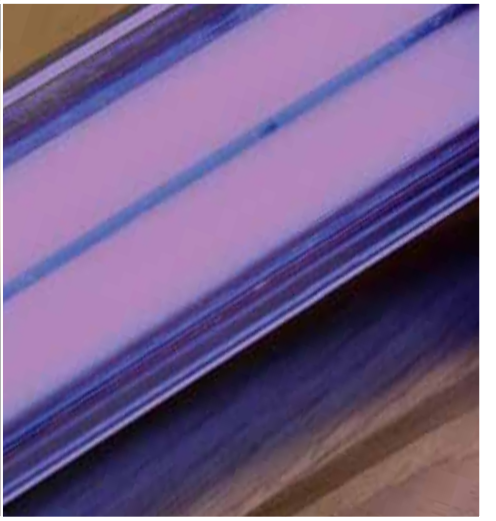


While our factory on the south coast of England assembles the drive units for an 800 Series speaker, the construction of the cabinet gets under way at B&W's plant in Agerbaek, Denmark. While a single 35mm thick sheet of ply is pressed into shape for the main cabinet body, its final skin of real wood veneer is selected by hand from only the top 10% of veneers available. All of the wood used is sourced from sustainable forests.





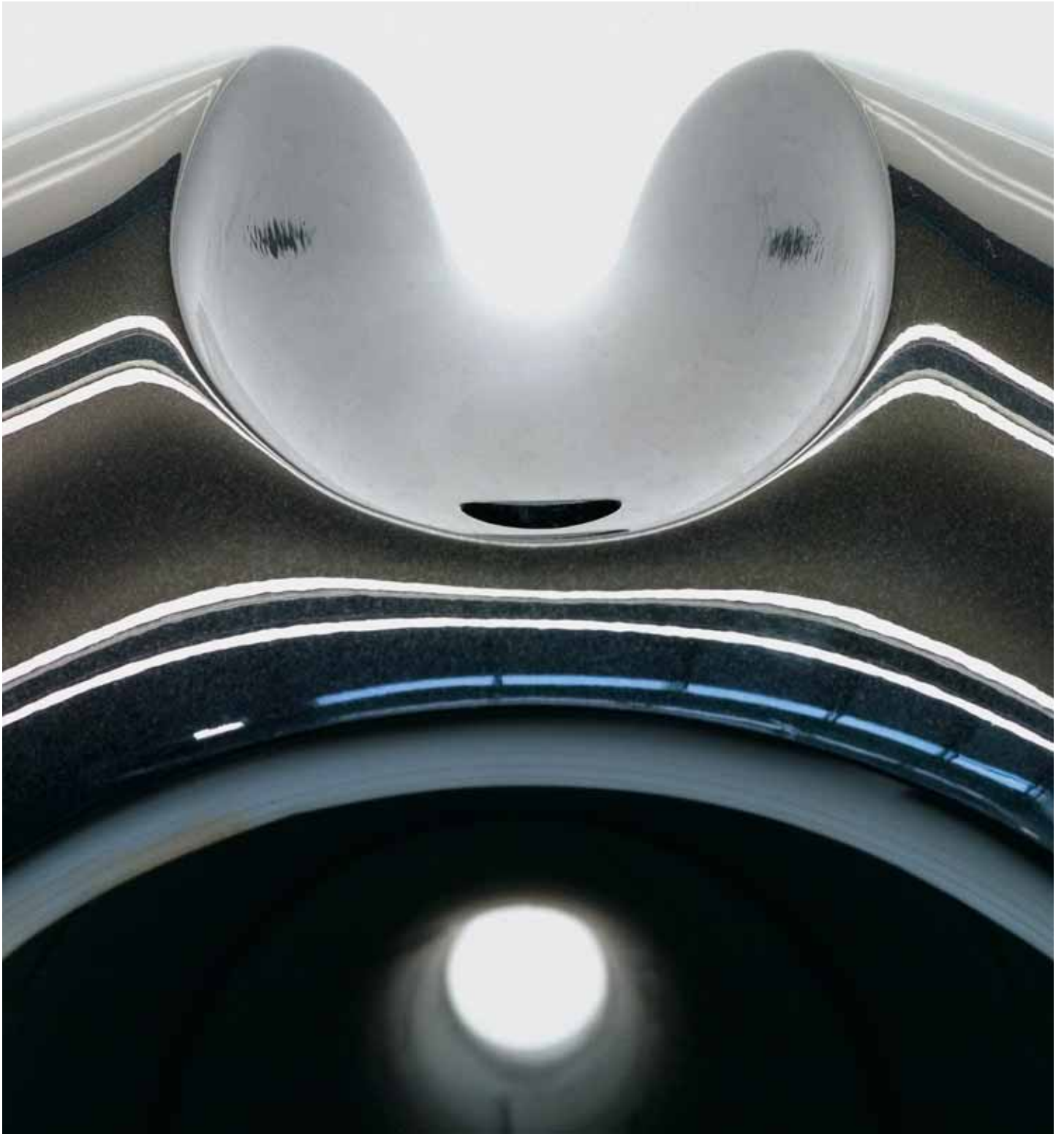
After robotic routing of the main cabinet shell and insertion of the Matrix internal bracing, the front fascia can be glued into place. But before the unit can be sent for staining, we have to be sure that all traces of excess glue – which resists the stain solution – are removed. It's not something we can leave to the human eye, so we mix a little ultra-violet sensitive agent into the glue and scan the dried joints. Any stray spots or bubbles can then be shown up and sanded away.



A piece of the furniture We think of cabinet-making as an art in itself, employing the finest materials, painstaking processes and the strictest environmental conditions. The Danish factory where it happens combines traditional Scandinavian wood craftsmanship with the most advanced equipment. It's a time-consuming, labour-intensive business: three hours of engineering goes into each and every 800 Series cabinet.

The factory features state-of-the-art production technology such as CAD/CAM systems and six-axis computer-controlled machining equipment. But complementing these technologies are individuals who have been employed in the factory all their working lives and carry with them the kind of skills and expertise in wood that have passed down through generations. When it opened in 1917, the factory was making lounge and bedroom furniture of solid wood. Later, applications for veneer became its speciality, and television cabinets were in huge demand. More recently, the production of loudspeaker cabinets has taken over and, in 2002, B&W took ownership. Today, the factory – which employs 200 people and works around the clock – manufactures some 75,000 real wood veneered cabinets a year.

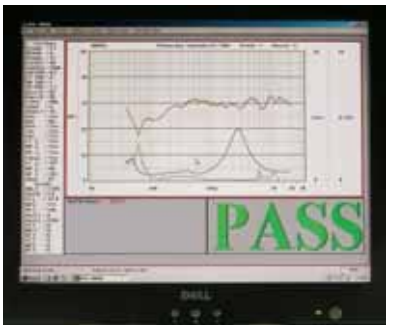
A drop of paint At the Danish factory, after a thorough sanding, the cabinet receives up to eight layers of lacquer to achieve its silken finish. In Worthing, meanwhile, the teardrop shape of the midrange head enclosure is receiving its high gloss finish. It's moulded from Marlan®, a synthetic, mineral-filled resin used in hard-wearing interior design applications such as yacht cabins, washbasins and worktops. We apply up to seven coats of paint so that, when the unit has been dried and polished, it's not just granite-hard but as smooth as glass.

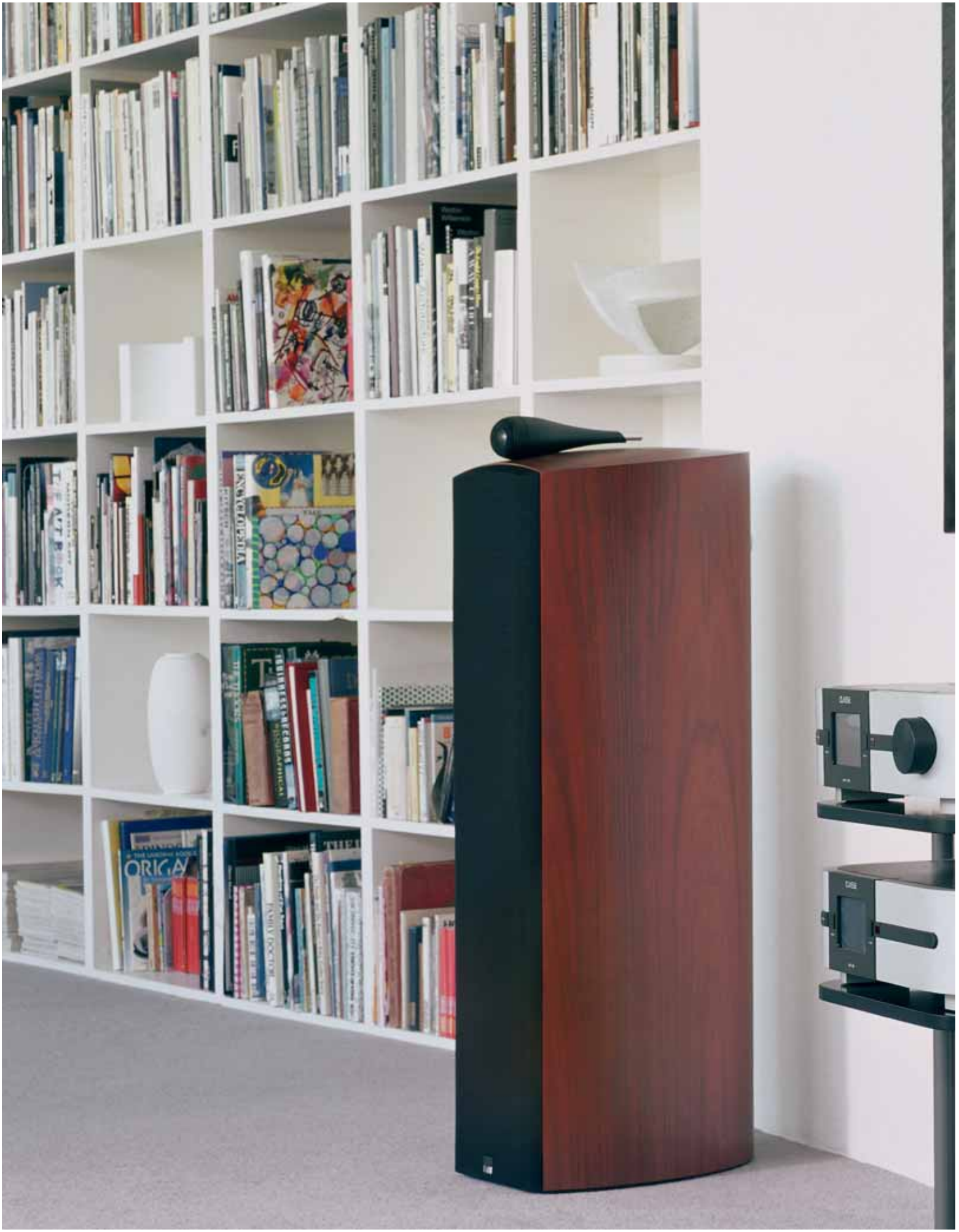


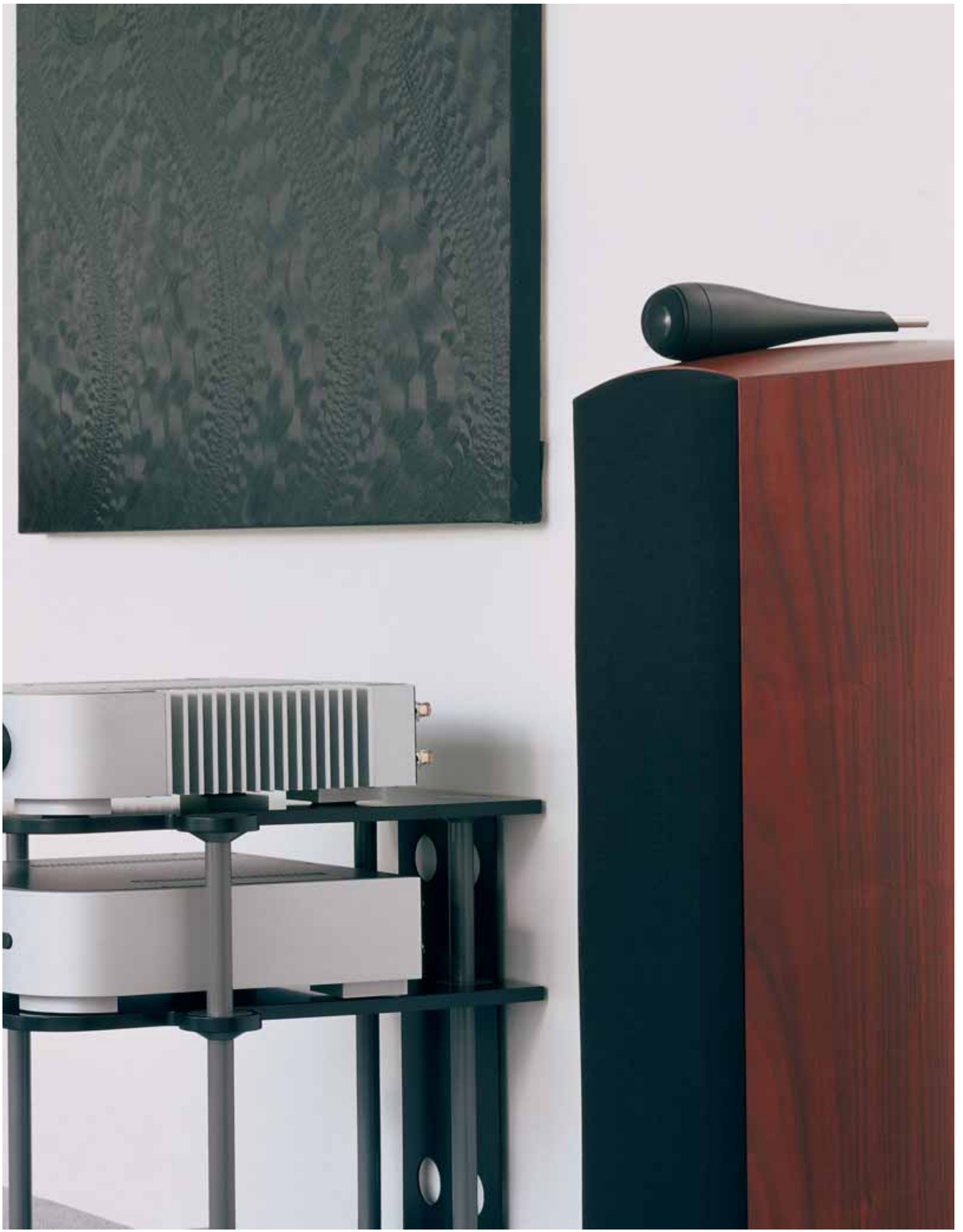
Fit for purpose Technological advances, groundbreaking research and world-class design have all helped keep B&W at the top of the tree. But equally has the dedication, skill and experience of our workforce in preserving the build quality of our products. Once the speaker cabinet has arrived in Worthing from Denmark, a small dedicated team oversees its entire final assembly and testing. The bass drive units and crossover are installed in the main cabinet, and the midrange driver and tweeter fitted to their respective enclosures, before the three units are positioned and secured together. It's all carried out with total commitment and care.

Debut performance So the speaker is complete. The cabinet has been pressed, glued, sanded and lacquered. The drive units have been fabricated and individually tested. The midrange head and tweeter tube have been moulded, sprayed and polished. And the whole loudspeaker has been meticulously assembled by hand. But there's one thing the speaker hasn't done yet: it hasn't made a sound. Its big chance comes at last. But it's a tough audition. We test the unit's performance and endurance under a range of different conditions, and only when we're absolutely satisfied on every criterion do we let it out of the door.

Then, and only then, is it ready for its real job: bringing sound of unparalleled quality, richness and clarity into your home.







Specifications

800 ◆

Technical features	Free-mounted diamond dome tweeter Kevlar® brand fibre cone FST™ midrange Rohacell® cone bass Nautilus™ head Matrix™ cabinet Flowport™
Description	3-way vented-box system
Drive units	1x ø25mm (1 in) diamond dome high-frequency 1x ø150mm (6 in) woven Kevlar® cone FST™ midrange 2x ø250mm (10 in) Rohacell® cone bass
Frequency range	-6dB at 25Hz and 33kHz
Frequency response	32Hz – 28kHz ±3dB on reference axis
Dispersion	Within 2dB of reference response Horizontal: over 60º arc Vertical: over 10º arc
Sensitivity	90dB spl (2.83V, 1m)
Harmonic distortion	2nd and 3rd harmonics (90dB, 1m) <1% 45Hz – 100kHz <0.5% 80Hz – 100kHz
Nominal impedance	8Ω (minimum 3.1Ω)
Crossover frequencies	350Hz, 4kHz
Recommended amplifier power	50W – 1000W into 8Ω on unclipped programme
Max. recommended cable impedance	0.1Ω
Dimensions	Height: 1180mm (46.5 in) not including feet Width: 450mm (17.7 in) Depth: 645mm (25.4 in)
Net weight	125kg (275 lb)
Finishes	Cabinet: Real wood veneers Cherrywood Rosenut Black Ash Grille: Black cloth

	801 ◆	802 ◆
Technical features	Free-mounted diamond dome tweeter Kevlar® brand fibre cone FST™ midrange Rohacell® cone bass Nautilus™ head Matrix™ cabinet Flowport™	Free-mounted diamond dome tweeter Kevlar® brand fibre cone FST™ midrange Rohacell® cone bass Nautilus™ head Matrix™ cabinet Flowport™
Description	3-way vented-box system	3-way vented-box system
Drive units	1x ø25mm (1 in) diamond dome high-frequency 1x ø150mm (6 in) woven Kevlar® cone FST™ midrange 1x ø380mm (15 in) Rohacell® cone bass	1x ø25mm (1 in) diamond dome high-frequency 1x ø150mm (6 in) woven Kevlar® cone FST™ midrange 2x ø200mm (8 in) Rohacell® cone bass
Frequency range	-6dB at 23Hz and 33kHz	-6dB at 27Hz and 33kHz
Frequency response	29Hz – 28kHz ±3dB on reference axis	34Hz – 28kHz ±3dB on reference axis
Dispersion	Within 2dB of reference response Horizontal: over 60º arc Vertical: over 10º arc	Within 2dB of reference response Horizontal: over 60º arc Vertical: over 10º arc
Sensitivity	90dB spl (2.83V, 1m)	90dB spl (2.83V, 1m)
Harmonic distortion	2nd and 3rd harmonics (90dB, 1m) <1% 40Hz – 100kHz <0.5% 50Hz – 100kHz	2nd and 3rd harmonics (90dB, 1m) <1% 40Hz – 100kHz <0.5% 70Hz –100kHz
Nominal impedance	8Ω (minimum 3.5Ω)	8Ω (minimum 3.5Ω)
Crossover frequencies	350Hz, 4kHz	350Hz, 4kHz
Recommended amplifier power	50W – 1000W into 8Ω on unclipped programme	50W – 500W into 8Ω on unclipped programme
Max. recommended cable impedance	0.1Ω	0.1Ω
Dimensions	Height: 1192mm (46.9 in) not including feet Width: 506mm (19.9 in) Depth: 682mm (26.9 in)	Height: 1135mm (44.7 in) not including feet Width: 368mm (14.5 in) Depth: 563mm (22.2 in)
Net weight	118kg (260 lb)	80kg (176 lb)
Finishes	Cabinet: Real wood veneers Cherrywood Rosenut Black Ash Grille: Black cloth	Cabinet: Real wood veneers Cherrywood Rosenut Black Ash Grille: Black cloth

	803 D	803 S
Technical features	Free-mounted diamond dome tweeter Kevlar® brand fibre cone FST™ midrange Rohacell® cone bass Matrix™ cabinet Flowport™	Free-mounted aluminium dome tweeter Kevlar® brand fibre cone FST™ midrange Rohacell® cone bass Matrix™ cabinet Flowport™
Description	3-way vented-box system	3-way vented-box system
Drive units	1x ø25mm (1 in) diamond dome high-frequency 1x ø150mm (6 in) woven Kevlar® cone FST™ midrange 3x ø180mm (7 in) Rohacell® cone bass	1x ø25mm (1 in) aluminium dome high-frequency 1x ø150mm (6 in) woven Kevlar® cone FST™ midrange 2x ø180mm (7 in) Rohacell® cone bass
Frequency range	-6dB at 28Hz and 33kHz	-6dB at 28Hz and 50kHz
Frequency response	35Hz – 28kHz ±3dB on reference axis	35Hz – 22kHz ±3dB on reference axis
Dispersion	Within 2dB of reference response Horizontal: over 60º arc Vertical: over 10º arc	Within 2dB of reference response Horizontal: over 60º arc Vertical: over 10º arc
Sensitivity	90dB spl (2.83V, 1m)	90dB spl (2.83V, 1m)
Harmonic distortion	2nd and 3rd harmonics (90dB, 1m) <1% 50Hz – 100kHz <0.5% 90Hz –100kHz	2nd and 3rd harmonics (90dB, 1m) <1% 70Hz – 22kHz <0.5% 80Hz – 20kHz
Nominal impedance	8Ω (minimum 3.0Ω)	8Ω (minimum 3.0Ω)
Crossover frequencies	350Hz, 4kHz	350Hz, 4kHz
Recommended amplifier power	50W – 500W into 8Ω on unclipped programme	50W – 250W into 8Ω on unclipped programme
Max. recommended cable impedance	0.1Ω	0.1Ω
Dimensions	Height: 1164mm (45.8 in) not including feet Width: 306mm (12 in) Depth: 457mm (18 in)	Height: 1063mm (41.9 in) not including feet Width: 291mm (11.5 in) Depth: 433mm (17 in)
Net weight	45kg (98 lb)	41kg (90 lb)
Finishes	Cabinet Real wood veneers Cherrywood Rosenut Black Ash Grille Black cloth	Cabinet Real wood veneers Cherrywood Rosenut Black Ash Grille Black cloth

	804	805
Technical features	Free-mounted aluminium dome tweeter Kevlar® brand fibre cone FST™ midrange Rohacell® cone bass Matrix™ cabinet Flowport™	Free-mounted aluminium dome tweeter Kevlar® brand fibre cone bass/midrange Matrix™ cabinet Flowport™
Description	3-way vented-box system	2-way vented-box system
Drive units	1x ø25mm (1 in) aluminium dome high-frequency 1x ø150mm (6 in) woven Kevlar® cone FST™ midrange 2x ø165mm (6.5 in) Rohacell® cone bass	1x ø25mm (1 in) aluminium dome high-frequency 1x ø165mm (6.5 in) woven Kevlar® cone bass/midrange
Frequency range	-6dB at 30Hz and 50kHz	-6dB at 42Hz and 50kHz
Frequency response	38Hz – 22kHz ±3dB on reference axis	49Hz – 22kHz ±3dB on reference axis
Dispersion	Within 2dB of reference response Horizontal: over 60º arc Vertical: over 10º arc	Within 2dB of reference response Horizontal: over 60º arc Vertical: over 10º arc
Sensitivity	90dB spl (2.83V, 1m)	88dB spl (2.83V, 1m)
Harmonic distortion	2nd and 3rd harmonics (90dB, 1m) <1% 90Hz – 22kHz <0.5% 120Hz – 20kHz	2nd and 3rd harmonics (90dB, 1m) <1% 100Hz – 22kHz <0.5% 150Hz –20kHz
Nominal impedance	8Ω (minimum 3.0Ω)	8Ω (minimum 3.7Ω)
Crossover frequencies	350Hz, 4kHz	4kHz
Recommended amplifier power	50W – 200W into 8Ω on unclipped programme	50W – 120W into 8Ω on unclipped programme
Max. recommended cable impedance	0.1Ω	0.1Ω
Dimensions	Height: 1020mm (40.2 in) not including feet Width: 238mm (9.4 in) Depth: 351mm (13.8 in)	Height: 418mm (16.5 in) Width: 238mm (9.4 in) Depth: 351mm (13.8 in)
Net weight	28kg (62 lb)	11.5kg (26 lb)
Finishes	Cabinet: Real wood veneers Cherrywood Rosenut Black Ash Grille: Black cloth	Cabinet: Real wood veneers Cherrywood Rosenut Black Ash Grille: Black cloth

	HTM 1	HTM 2
Technical features	Free-mounted diamond dome tweeter Kevlar® brand fibre cone FST™ midrange Rohacell® cone bass Nautilus™ head Matrix™ cabinet Flowport™ Magnetic shielding	Free-mounted diamond dome tweeter Kevlar® brand fibre cone FST™ midrange Rohacell® cone bass Matrix™ cabinet Flowport™ Magnetic shielding
Description	3-way vented-box system	3-way vented-box system
Drive units	1x ø25mm (1 in) diamond dome high-frequency 1x ø150mm (6 in) woven Kevlar® cone FST™ midrange 3x ø200mm (8 in) Rohacell® cone bass Frequency range	1x ø25mm (1 in) diamond dome high-frequency 1x ø150mm (6 in) woven Kevlar® cone FST™ midrange 2x ø180mm (7 in) Rohacell® cone bass
Frequency range	-6dB at 32Hz and 33kHz	-6dB at 35Hz and 33kHz
Frequency response	38Hz – 28kHz ±3dB on reference axis	41Hz – 28kHz ±3dB on reference axis
Dispersion	Within 2dB of reference response Horizontal: over 60º arc Vertical: over 10º arc	Within 2dB of reference response Horizontal: over 60º arc Vertical: over 10º arc
Sensitivity	90dB spl (2.83V, 1m)	90dB spl (2.83V, 1m)
Harmonic distortion	2nd and 3rd harmonics (90dB, 1m) <1% 55Hz – 100kHz <0.5% 100Hz –100kHz	2nd and 3rd harmonics (90dB, 1m) <1% 80Hz – 100kHz <0.5% 100Hz –100kHz
Nominal impedance	8Ω (minimum 3.7Ω)	8Ω (minimum 3.1Ω)
Crossover frequencies	350Hz, 4kHz	350Hz, 4kHz
Recommended amplifier power	50W – 500W into 8Ω on unclipped programme	50W – 300W into 8Ω on unclipped programme
Max. recommended cable impedance	0.1Ω	0.1Ω
Dimensions	Height: 585mm (23 in) Width: 974mm (38.3 in) Depth: 580mm (22.8 in)	Height: 329mm (13 in) Width: 841mm (33.1 in) Depth: 387mm (15.2 in)
Net weight	93kg (205 lb)	31kg (68 lb)
Finishes	Cabinet Real wood veneers Cherrywood Rosenut Black Ash Grille Black cloth	Cabinet Real wood veneers Cherrywood Rosenut Black Ash Grille Black cloth

	HTM 3	HTM 4
Technical features	Free-mounted aluminium dome tweeter Kevlar® brand fibre cone FST™ midrange Rohacell® cone bass Matrix™ cabinet Magnetic shielding	Free-mounted aluminium dome tweeter Kevlar® brand fibre cone bass/midrange Matrix™ cabinet Flowport™ Magnetic shielding
Description	3-way closed-box system	2-way vented-box system
Drive units	1x ø25mm (1 in) aluminium dome high-frequency 1x ø150mm (6 in) woven Kevlar® cone FST™ midrange 2x ø165mm (6.5 in) Rohacell® cone bass	1x ø25mm (1 in) aluminium dome high-frequency 1x ø165mm (6.5 in) woven Kevlar® cone bass/midrange
Frequency range	-6dB at 35Hz and 50kHz	-6dB at 42Hz and 50kHz
Frequency response	42Hz – 22kHz ±3dB on reference axis	49Hz – 22kHz ±3dB on reference axis
Dispersion	Within 2dB of reference response Horizontal: over 60º arc Vertical: over 10º arc	Within 2dB of reference response Horizontal: over 60º arc Vertical: over 10º arc
Sensitivity	90dB spl (2.83V, 1m)	88dB spl (2.83V, 1m)
Harmonic distortion	2nd and 3rd harmonics (90dB, 1m) <1% 100Hz – 22kHz <0.5% 120Hz –20kHz	2nd and 3rd harmonics (90dB, 1m) <1% 100Hz – 22kHz <0.5% 150Hz –20kHz
Nominal impedance	8Ω (minimum 3.2Ω)	8Ω (minimum 2.6Ω)
Crossover frequencies	350Hz, 4kHz	4kHz
Recommended amplifier power	50W – 250W into 8Ω on unclipped programme	50W – 120W into 8Ω on unclipped programme
Max. recommended cable impedance	0.1Ω	0.1Ω
Dimensions	Height: 320mm (12.6 in) Width: 783mm (30.8 in) Depth: 316mm (12.4 in)	Height: 279mm (11 in) Width: 486mm (19.1 in) Depth: 287mm (11.3 in)
Net weight	28kg (62 lb)	12.5kg (27 lb)
Finishes	Cabinet: Real wood veneers Cherrywood Rosenut Black Ash Grille: Black cloth	Cabinet: Real wood veneers Cherrywood Rosenut Black Ash Grille: Black cloth

ASW855

Technical features	Rohacell® cone bass Matrix™ cabinet 1000W Class-D amplifier	
Description	Active closed-box subwoofer system	
Drive unit	ø380mm (15 in) Rohacell® cone long-throw	
Frequency range	-6dB at 14Hz and 40/140Hz adjustable (EQ at A)	
Frequency response	±3dB 18Hz – 31/110Hz adjustable (EQ at A)	
Amplifier	Power output:	1000W continuous
	Rated power consumption:	150W
	Input impedance:	33kΩ
	Signal / noise:	>90dB
	Functions:	Volume control
		Low-pass filter frequency
		Low-pass filter bypass
		Bass roll-off alignment
		Auto sense on/standby
		Phase switch
	Inputs:	Line In (RCA Phono)
	Outputs:	Line Out (RCA Phono) high-passed
		Link Out (RCA Phono)
	Low-pass filter	Active 2nd-order, variable cut-off frequency
	High-pass filter	Active 3rd-order -6dB at 80Hz
Dimensions	Height:	529mm (20.8 in) not including feet
	Width:	562mm (22.1 in)
	Depth:	522mm (20.6 in) including grille and controls
Net weight	45kg (99 lb)	
Finishes	Cabinet	Real wood veneers
		Cherrywood
		Rosenut
		Black Ash
	Grille	Black cloth

ASW825

Technical features	Rohacell® cone bass Matrix™ cabinet 1000W Class-D amplifier	
Description	Active closed-box subwoofer system	
Drive unit	ø300mm (12 in) Rohacell® cone long-throw	
Frequency range	-6dB at 15Hz and 40/140Hz adjustable (EQ at A)	
Frequency response	±3dB 20Hz – 31/110Hz adjustable (EQ at A)	
Amplifier	Power output:	1000W
	Rated power consumption:	150W
	Input impedance:	33kΩ
	Signal/noise:	>90dB
	Functions:	Volume control Low-pass filter frequency Low-pass filter bypass Bass roll-off alignment Auto sense on/standby Phase switch
	Inputs:	Line In (RCA Phono)
	Outputs:	Line Out (RCA Phono) high-passed Link Out (RCA Phono)
	Low-pass filter	Active 2nd-order, variable cut-off frequency
	High-pass filter	Active 3rd-order -6dB at 80Hz
Dimensions	Height:	529mm (20.8 in) not including feet
	Width:	476mm (18.7 in)
	Depth:	351mm (13.8 in) including grille and controls
Net weight	35kg (77 lb)	
Finishes	Cabinet	Real wood veneers Cherrywood Rosenut Black Ash
	Grille	Black cloth

	SCM	DS8
Technical features	Tube loaded aluminium dome tweeter Kevlar® brand fibre cone bass/midrange Matrix™ cabinet Flowport™ Adjustable bracket for on-wall mounting included	Tube loaded aluminium dome tweeter Kevlar® brand fibre cone bass/midrange Matrix™ cabinet Bracket for on-wall mounting included
Description	2-way vented-box system	2-way closed-box selectable dipole/monopole surround system
Drive units	1x ø25mm (1 in) aluminium dome high-frequency 1x ø165mm (6.5 in) woven Kevlar® cone bass/midrange	3x ø25mm (1 in) aluminium dome high-frequency 2x ø100mm (4 in) midrange/high-frequency 1x ø180mm (7 in) woven Kevlar® cone bass/midrange
Frequency range	-6dB at 48Hz and 50kHz	-6dB at 45Hz and 50kHz (monopole mode) -6dB at 45Hz and 18kHz (dipole mode)
Frequency response	60Hz – 22kHz ±3dB on reference axis	60Hz – 22kHz ±3dB on reference axis (monopole mode) 60Hz – 15kHz ±3dB power averaged over front hemisphere (dipole mode)
Dispersion	Within 2dB of reference response Horizontal: over 60º arc Vertical: over 10º arc	Monopole mode: within 2dB of reference response Horizontal: over 40º arc Vertical: over 10º arc Dipole mode: horizontal figure of eight Effective null zone ±30º (250Hz – 15kHz)
Sensitivity	88dB spl (2.83V, 1m)	89dB spl (2.83V, 1m)
Harmonic distortion	2nd and 3rd harmonics (90dB, 1m) <1% 100Hz – 22kHz <0.5% 150Hz –20kHz	2nd and 3rd harmonics (90dB, 1m) <1%120Hz – 22kHz <0.5% 150Hz –20kHz
Nominal impedance	8Ω (minimum 4.7Ω)	8Ω (minimum 4.4Ω)
Crossover frequency	4kHz	4kHz (monopole mode) 250Hz & 4kHz (dipole mode)
Recommended amplifier power	50W – 120W into 8Ω on unclipped programme	25W – 120W into 8Ω on unclipped programme
Max. recommended cable impedance	0.1Ω	0.1Ω
Dimensions	Height: 399mm (15.7 in) Width: 373mm (14.7 in) Depth: 219mm (8.6 in) not indluding wall bracket	Height: 360mm (14.2 in) Width: 622mm (24.5 in) Depth: 205mm (8.1 in)
Net weight	8.5kg (19 lb)	15kg (33 lb)
Finishes	Cabinet Real wood veneers Cherrywood Rosenut Black Ash Grille Black cloth	Cabinet Real wood veneers Cherrywood Rosenut Black Ash Grille Black cloth
Supplementary data:		12V relay current requirement 45mA

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