

Decoupled Double Dome Tweeter

At Bowers & Wilkins we believe that the best tweeters use the stiffest and lightest assemblies because we want our drive unit diaphragms to remain pistonic for as long as possible. However the problem with all structures is that the higher in frequency they are driven the harder is it for them to remain stable. At a given frequency the structure will lose its integrity and start to bend and flex. At this point the structure is said to be in 'break-up'. As a general rule of thumb the higher in frequency we can push this break-up frequency the cleaner the high-frequency performance of the loudspeaker becomes.

In our premium 800 Series Diamond we achieve this by creating a tweeter dome from a very thin layer of diamond. This produces the stiffest structure we can possibly make and pushes the break-up frequency to 70kHz, a significant

improvement on our conventional aluminium tweeter, which has a break-up frequency of 30kHz. However this advanced technology has a high associated cost so, despite its ability, it is not appropriate for use in every application. Our solution is the Double Dome tweeter.

By using advanced Finite Element Analysis (FEA) techniques we can show that at break up the conventional aluminium tweeter is weakest at the edge of the dome, where the voice coil is connected to the dome. This can be seen in the image below.

The Double Dome design comprises a 35-micron aluminium diaphragm reinforced with a 50-micron ring profile bonded to the rear surface of the dome. This stiffens the structure in its weakest area and pushes the break-up frequency of the structure up to 38kHz. At the same time, this approach

minimises the amount of mass being added to the assembly.

Across the entire CM Series, every tweeter is fully decoupled from the loudspeaker cabinet, achieved by housing the high-frequency assembly in a soft gel-like material so that it effectively floats free of the baffle. This isolates any of the energy generated by the tweeter from the cabinet, therefore reducing any unwanted sound generated by the cabinet itself and also stopping any of the low and mid-frequency energy (generated by the larger drive units in the enclosure) from affecting the tweeter's output.

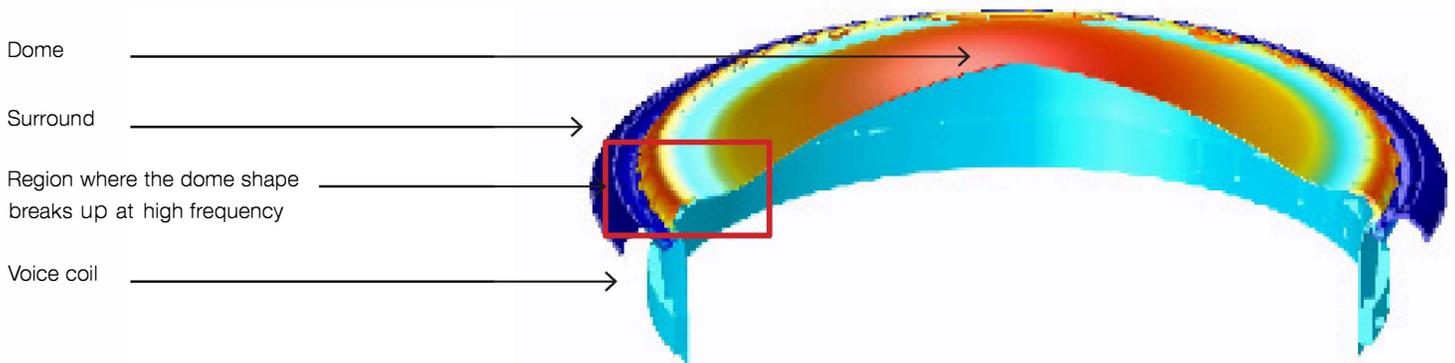


Figure 1 - Current CM Series 25mm aluminium dome

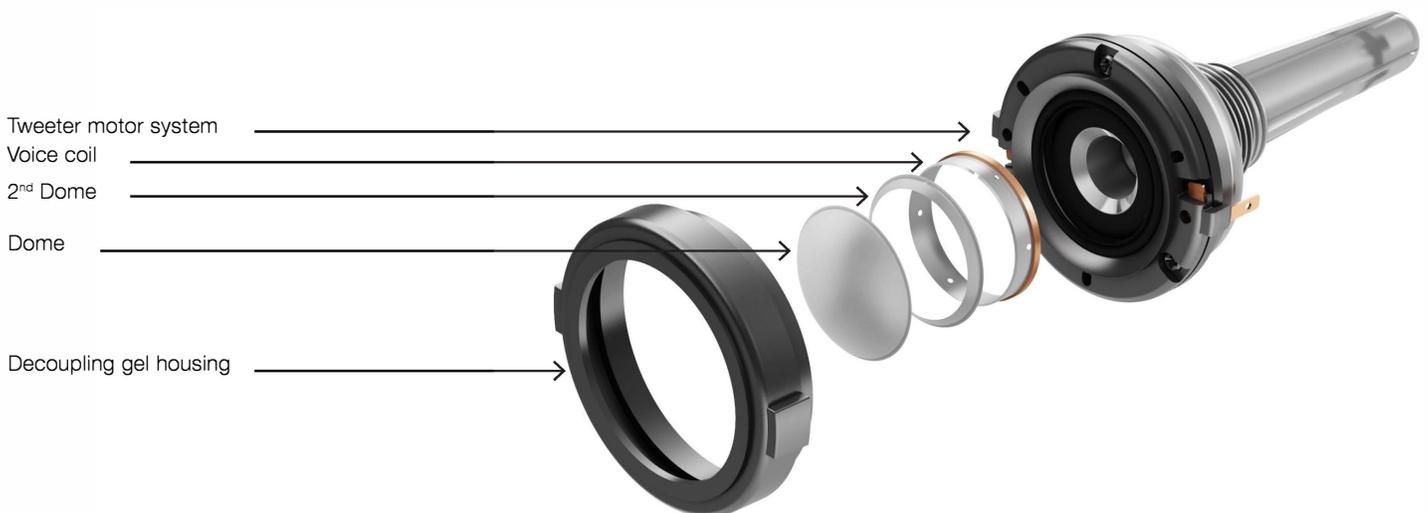


Figure 2 - Exploded view of tweeter assembly