



Serpentine Sackler Gallery
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Gallery Space

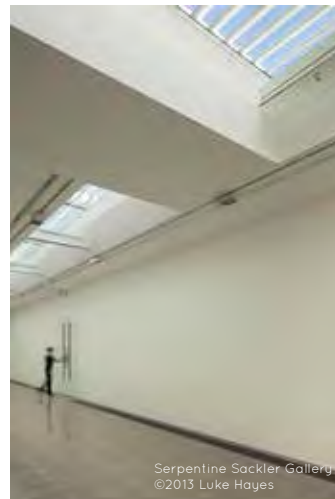
The Serpentine Sackler Gallery, designed by Zaha Hadid Architects, opened to the public on 28 September 2013 and gives new life to The Magazine, a former 1805 gunpowder store located seven minutes' walk from the Serpentine Gallery on the north side of the Serpentine Bridge. With 900 square metres of new gallery, shop, restaurant and social space, the Serpentine's second space in Kensington Gardens is a new cultural destination in the heart of London.

Instrumental to the transformation into a public art gallery was the decision to reinstate the historic arrangement of The Magazine building as a free standing pavilion within an enclosure, whereby the former courtyards would be covered and become internal exhibition spaces. In order to reveal the original central spaces, all non-historic partition walls within the former gunpowder stores were removed. Audio and lighting systems were discretely integrated so as to not interfere with the 'as found' quality of the spaces.

Integral to the daily operations of the Serpentine Sackler Gallery was the inclusion of a high quality audio and loudspeaker system. Zaha Hadid Architects' vision of interior minimalism, coupled with the need for the original architectural features of the gunpowder stores to retain precedence, meant that the choice of loudspeaker for the 3.6m high internal gallery spaces surrounding the former gunpowder stores was vital.

Arup's Specialist Technical Engineers recognised that ideally a completely invisible loudspeaker was required. The audio system specification was for public address, audio content for art exhibitions, voice re-enforcement for presentations and background/foreground music during events. Arup, therefore, began discussions with Amina Technologies in order to specify the perfect invisible speaker system for such for this ambitious restoration project and the new social space.

From the outset it was essential that the speaker system provided full range sound, i.e. bass response below 100Hz. This is the natural limit of the majority of Amina's invisible range (hence the firm also manufactures highly discrete subwoofers), however the company had not long begun shipping their newest invisible model the AIW750E. The AIW750E is the flagship Amina invisible loudspeaker and as such produces the widest bandwidth and highest power handling of the Evolution Series range. By using two separate vibrational panels per speaker fed via an external crossover-cum-protection circuit, the AIW750E operates from 50Hz - 20KHz along with the Amina trademark ultra-wide dispersion and ability to integrate sympathetically with an interior's acoustically reflective surfaces. This was music to Arup's ears who quickly selected it as the ideal speaker solution for the gallery spaces.



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The next task was to select appropriate speaker locations in order to provide seamless, high quality audio in the gallery spaces. Working closely with the architects, the applications team at Amina calculated that eleven speakers in total would be required to cover the gallery space. Positioned in-ceiling the spacing between speakers is a large 5m – a benefit of their ultra-wide dispersion. Conventional, and typically more directional, speakers would need a closer spacing and therefore a higher quantity which increases installation, cabling and amplification costs.

Amina's applications team worked in conjunction with the construction engineering team to ensure that the plasterboard ceiling was built to ensuring the best performance from the AIW750E. Installed using Amina's BackboxCV345, installation back boxes provided minimal sound bleed into the ceiling cavity. Ceiling set-out design was undertaken to ensure that unwanted mechanical vibrations were stopped, one method used was to fix plasterboard sheets to the supporting frame with a higher than usual number of fixing screws. Once correctly fitted to the plasterboard a 2mm standard plaster skim was applied to the ceiling, concealing the speakers. The AIW750E is engineered for optimal performance once a 2mm plaster skim is applied to its flat vibrational panel surface and delivers 87dB/1m/2.83Vrms sensitivity.

An expert sound engineering company completed the installation process by integrating the audio system. One of the initial challenges of integrating the AIW750E speakers with a 100V line amplifier system was how to deal with the AIW750E's matching APU750 cross-over circuit, designed to operate on a low impedance loudspeaker circuit. Amina and RG Jones' technical teams combined resources to engineer a bespoke housing for both 100V line transformer and APU750 combined, designed for installation close to each speaker within the ceiling void.

Driving the speakers are Lab.gruppen E-Series amplifiers controlled by the latest DSP (digital signal processing) equipped QSYS 250i core from QSC. The system allows scope for system control and fine-tuning to the acoustic environment, carefully tuned volume limiters and tonal equalisation has resulted in a highly robust system.

The gallery staff access the audio system via an easy to use touch screen interface which provides control over source selection, whether that is the PA microphone, portable microphones or external music sources. The speakers are divided into zones which can easily be switched on or off by the graphic touch screen display, making for a hugely flexible system.

Highly intelligible sound extends to every corner of the Gallery space. Music reproduction is smooth and full of detail, as Amina's unique vibrational panel technology works in harmony with the interior acoustics. Together with an expertly setup audio system, Amina has provided the Serpentine Sackler Gallery with the perfect loudspeaker solution, combining the ultimate in visual discretion with seamless, high clarity audio coverage.



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