Ask The Expert: Amina Technologies

Babs Moore of Amina Technologies tells us about the company's pioneering development of invisible sound technology

Could you give us an overview of the company?

An innovation happened more than 20 years ago now where it was discovered that highly reflective and accurate sound reproduction could be made electrically by creating a vibrational sound board rather than the conical shaped piston speaker we are familiar with. Over the last 15 years Amina Technologies both pioneered the commercial development of this technology and continue to lead its innovation today through an application that is not possible with conventional speakers: A speaker that is plastered over and is thus rendered invisible once installed.

Using this technology Amina Technologies Ltd design and manufacture invisible loudspeakers and is based in Huntingdon in Cambridgeshire. The company was formed in 1999 by the current MD, Richard Newlove to create product utilising this new way of creating sound. Initially the products developed were aimed at commercial applications but today around 50% of the products made are used in residential projects. Amina invented the invisible loudspeaker in 2001 whilst working on a prestigious German Bank boardroom and it became quickly apparent that this was a perfect product for aesthetically conscious home owners wanting high quality audio without visible intrusion into the interior design of their home.

Today, Amina invisible loudspeakers are sold throughout the world into a wide range of applications such as aesthetically sensitive modern minimalist or historic projects including high end residential, prestigious hotels and restaurants, designer label flagship shops and super yachts.

What makes your speakers different to standard loudspeakers?

The single most important thing is that they are invisible once installed and remove the need for any visible sound sources, yet provide high clarity room-filling sound.

The invisible speakers also look very different, the speakers themselves are only 4cm deep and the front of the speaker is a flat panel made of aluminium aerospace honeycomb material. Uninstalled they have a rugged industrial look and feel to be able to survive being on the building site whilst construction is ongoing. The products are designed to be built into walls or ceilings and, most commonly, be rendered invisible by a 2mm final skim of plaster and thus leave no visible evidence of where they are positioned. The speakers can also be fitted behind wood panelling, wood veneer, MDF, leather and other materials. Amina are happy to give advice on suitable materials to use and in all cases the covering needs to be fixed to the speaker so there is no air gap.

Amina invisible loudspeakers create sound using Vibrational Panel Technology (VPT) which is very different to the traditional 'cone in a box' loudspeakers that everyone is familiar with. VPT loudspeakers make sound through creating tiny vibrations in a highly resonant flat panel sound board. This is similar to how many acoustical music instruments make sound such as an acoustic guitar. An electric guitar only makes sound when plugged into the amplifier because it is not the strings as such that make the sound. The plucking of the strings by the musician creates energy which is turned into sound through the vibration of the light-weight wooden, rigid sound box, The exciter(s) on the back of Amina Invisible Loudspeakers create tiny vibrations in the front panel in the same way. These vibration are minute and impossible to see although they can be felt by touching the front of the speaker with finger tips.

How does the sound output of an Amina speaker differ from a traditional speaker?

Traditional loudspeakers create sound using the pistonic actions of a rigid cones or domes. Inherent in any pistonic sound source is increased directionality as the pitch of the sound become higher. This is why higher quality examples of conventional loudspeakers use a combination of different size 'woofers' and 'tweeters' in an attempt to make the sound less directional. This is important for any speaker so that it reproduces the full range of sounds over a broad listening area.

The inherently dispersive nature of VPT loudspeakers means that all frequencies spread effectively hemi-spherically from the wall or ceiling providing a larger 'sweet spot' than is the case with conventional loudspeakers. This is best visualised by thinking of the way that sound spreads from an acoustical musical instrument such as a violin. Thinking about a circular concert venue then, it does not matter where the listener is sitting with respect to a violinist, the music is audible to all, even if not loud. To reproduce this effect through a conventional loudspeaker is difficult. Firstly, it would be very loud at source, which a violin isn't, and also for those off axis i.e. not in the cone of sound produced by the loudspeaker, then increasingly the high frequencies would be lost. Thinking of how an acoustical musical instrument sounds in real life compared with conventional loudspeakers in the easiest way to understand the difference in sound output. It is very hard to describe the difference in sound but as human beings we can hear the difference. This has been demonstrated in

restaurant projects using Amina where clients have moved from their seats to go and see the band they thought was playing in the adjoining area once a refurbishment with invisible speakers has been completed and that never happened with conventional ceiling speakers. Repeatedly we have been told, particularly by classical music lovers, that VPT loudspeakers are more natural, akin to being at a live concert.

In addition, conventional loudspeakers have what is called a coherent waveform and in acoustically harsh environments, so common in many modern minimalist designs, hot and cold spots can occur due to cancellation and addition effects. For VPT loudspeakers the waveform is incoherent and thus they cope well with acoustically harsh environments as reflections are principally additive. These two differences mean that in large areas where the same music/speech is being played through multiple speakers it is possible to use fewer speakers, up to 2-4 times less depending on application, whilst maintaining a more even sound pressure level (SPL).

Are you seeing a growth in the trend/demand for invisible loudspeaker solutions?

Yes, the market is becoming increasingly aware that truly invisible sound is a viable option and the perfect solution for aesthetically sensitive projects. One of the biggest challenges we face is making people aware that a product that cannot be seen even exists. The fact that an increasing number of competitors are appearing on the market is a complement to the work Amina have done and also demonstrates that others are seeing the demand for invisible and extremely discrete sound solutions increasing. The growth in multi-room audio for residential applications combined with the increase in modern minimalist interiors creates underlying demand for continued market expansion. Amina's direct customers are audio, video and smart technology installation companies. However, we work increasingly with key influencers such as architects, interior designers and property developers to encourage invisible sound to be specified at an early stage in the project.

Which new products have you added to your range?

In 2013, Amina launched our iQ Developer Series which has a smaller footprint and a more aggressive price performance point than the existing Evolution Series. This series was introduced with the developer in mind based on experience gained from some previous work in high end multi-dwelling units (MDUs). On several occasions, based on pricing, circular 'dinner plate' loudspeakers had been selected for marketing suites only for invisible sound to be retrofitted following feedback from prospective purchasers. In a couple of cases invisible speakers were used to provide surround sound in the main living area but 'dinner plates' remained in the bedrooms. Amina identified that there was a need for a more cost effective product that sounded almost as good as the flagship Evolution Series but at a price point that was attractive to those looking to add value to their property developments whilst remaining within budget. This Developer Series has also proved popular in high end private residences where Evolution Series products are used in reception rooms and the master bedroom, but for guest rooms, which would have otherwise used conventional circular ceiling speakers, the price point enables invisible speakers to be used throughout.

Can you tell us more about your awards and accreditations?

2014:- Amina recently won the gold award from SVI (Sound Visual Install) magazine for best architectural loudspeakers and best manufacturer. The Amina Continuous Professional Development (CPD) Seminar 'Understanding and Specifying Invisible Sound Solutions' is accredited by RIBA (Royal Institute of British Architects) and the BIID (British Institute of Interior Designers). We present CPDs at professional practices most weeks and offer open CPDs at our London Showroom on a monthly basis.

Amina manufactures, assembles and test its product in the UK rather than sourcing from overseas, what are the benefits to Amina of doing this?

When Amina started to design and manufacture loudspeakers using VPT, the technology was in its infancy and the learning curve was steep and thus the only way to effectively develop the product was to design and build in house. Today, Amina are world leaders in using this technology. More resources are invested in research and developments than at any time in the company's history as Amina continually develop the range of super discrete audio products available. Today, few people can believe the quality of the sound produced from speakers that cannot be seen, without experiencing the product for themselves. Amina now has three products families, the top of the range Evolution Series for residential applications, the iQ Developer Series for MDU's and other volume applications and the LFieT series for commercial properties. Technologies originally designed for the Evolution series which was launched in 2012; Opti-Damping, Opti-Drive and Opti-Modal to provide even better quality reproduction has now been migrated into the other series. This continuous process of evolving quality and reliability, essential in products that

are fully installed into a property, whilst maintaining a market leadership position in invisible sound is why Amina have no plans to move manufacturing away from its UK base.

What do you see for the future of loudspeakers, where is technology going to go?

We are frequently asked about wireless speakers. For speakers plastered into a wall or ceiling and designed to last many years, it is not practical or sensible to opt for wireless as protocol standards and electronic component reliability is a lot less predictable. What can be wireless is the connection between the sound source and the amplifier but the connection from the amplifier to the speakers needs to be wired. The general trends we see are away from a conventional Hi-Fi system to media rooms, dedicated home cinemas and multi-room audio throughout the house with either local sources or increasingly a central server containing all content. For those design conscious consumers there is definitely a requirement for loudspeakers to be discrete, or preferably invisible, so that aesthetics are not impacted by the presence of visible sound sources.

For more information, visit www.amina.co.uk

Simple to install