New flat flexible speakers might even help you catch planes and trains

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(PhysOrg.com) -- A groundbreaking new loudspeaker, less than 0.25mm thick, has been developed by University of Warwick engineers, it's flat, flexible, could be hung on a wall like a picture, and its particular method of sound generation could make public announcements in places like passenger terminals clearer, crisper, and easier to hear.

Lightweight and inexpensive to manufacture, the speakers are slim and flexible: they could be concealed inside ceiling tiles or car interiors, or printed with a design and hung on the wall like a picture.

Pioneered by University of Warwick spin-out company, Warwick Audio Technologies' the 'Flat, Flexible Loudspeaker' (FFL) is ideal for public spaces where it delivers planar directional sound waves, which project

further than sound from conventional speakers.

Steve Couchman, CEO of Warwick Audio Technologies, believes it could entirely replace the speakers currently used in homes and in cars, as well as in public address systems used in passenger terminals and shopping centres.

He says: "We believe this is a truly innovative technology. Its size and flexibility means it can be used in all sorts of areas where space is at a premium. Audio visual companies are investigating its use as point of sale posters for smart audio messaging and car manufacturers are particularly interested in it for its light weight and thinness, which means it can be incorporated into the headlining of cars, rather than lower down in the interior."

All speakers work by converting an electric signal into sound. Usually, the signal is used to generate a varying magnetic field, which in turn vibrates a mechanical cone, so producing the sound.

Warwick Audio Technology's FFL technology is a carefully designed assembly of thin, conducting and insulating, materials resulting in the development of a flexible laminate, which when excited by an electrical signal will vibrate and produce sound.

The speaker laminate operates as a perfect piston resonator. The entire diaphragm therefore radiates in phase, forming an area source. The wave front emitted by the vibrating surface is phase coherent, producing a plane wave with very high directivity and very accurate sound imaging.

"Another great application would be in PA systems for public spaces," says Steve. "The sound produced by FFLs can be directed straight at its intended audience. The sound volume and quality does not deteriorate as it does in conventional speakers, which means that public

announcements in passenger terminals, for example, could be clearer, crisper, and easier to hear."

The FFL was first developed by Dr Duncan Billson and Professor David Hutchins, both from the University of Warwick, with early trials using just two sheets of tinfoil and an insulating layer of baking paper to produce sound. Since then its design has significantly evolved and the technology is now ready for commercial exploitation

The company is currently in negotiations with a number of commercial partners and continues to welcome fresh approaches. It expects to launch its first commercial product later this year.

Provided by University of Warwick