



Above: New LEAK Sandwich 250 loudspeakers with optional floor stands

LEAK prepares tasty Sandwich

63 years on from its debut, a landmark of British loudspeaker design returns – LEAK' s new Sandwich speakers evolve their forebears' revolutionary driver cones with the latest techniques and materials

Cambridgeshire, England – One of the biggest names of the mid-twentieth century hi-fi scene, LEAK returned in 2020 with its first new products since the 1970s. The arrival of the LEAK Stereo 130 integrated amplifier and LEAK CDT CD transport rapidly became one of the most talked-about hi-fi events of the year, followed at the end of 2022 by a second integrated amp, the Stereo –230 – all fusing the vintage appeal of classic LEAK design with state-of-the-art audio circuitry.

This February, LEAK' s line-up expands further with the addition of two loudspeaker models, once again inspired by LEAK' s illustrious past. The Sandwich 150 and Sandwich 250 take the blueprint established by the original, highly innovative LEAK Sandwich speaker, which debuted in 1961, and apply state-of-the-art technologies and materials to deliver the ultimate incarnations of a bone fide British classic.

The original LEAK Sandwich – a landmark loudspeaker design

In the 1950s, loudspeaker cones suffered from a common problem – a lack of stiffness. To elaborate: in order to obtain low distortion, the movement of a speaker cone should follow the waveform of the signals applied to its voice coil as accurately as possible, and its ability to do so depends upon the lightness and stiffness of the cone assembly.

Many conventional cone materials – paper, impregnated fabric, plastics, aluminium and so on – exhibit less than ideal stiffness. This results in significantly larger areas of the cone vibrating in motion, uncontrolled by the voice coil. These uncontrolled motions produce transit ‘hangover’, amplitude distortion (peaks and troughs in the frequency response) and intermodulation distortion (lack of clarity of spurious tones). All of these are detrimental to sound quality.

Introduced in 1961, the original LEAK Sandwich speaker tackled this issue in an innovative way. Its mid/bass drive unit was the first to be constructed from a ‘sandwich’ of different materials: expanded polystyrene foam between two sheets of aluminium foil. This made it both very light and extremely stiff, enabling true pistonic motion and therefore more accurate sound.

A publicity photograph produced at the time showed LEAK’s founder, Harold Leak, standing on a Sandwich cone to demonstrate its exceptional rigidity. But the cone was not the Sandwich speaker’s only innovation – for example, the cabinet introduced bracing techniques subsequently adopted by many other manufacturers – and LEAK went on to produce other two-way and three-way iterations through the 1960s and early/mid 1970s to great commercial and critical success.

Introducing the NEW
Revolutionary **LEAK**
SANDWICH
Loudspeaker System

A cone needs to be light AND stiff, but hitherto materials, which of necessity have had to be used for their low mass, have suffered from a low stiffness factor. This produced the distortions which have bedevilled loudspeaker design ever since the first moving-coil loudspeaker was produced in 1925.

Now, a member of the Leak research team has invented a revolutionary diaphragm, consisting of expanded moulded polystyrene [in, thick "sandwiched" in between two very thin sheets of aluminium foil. Hence the system's name.

The cone, as light as a conventional one, is 200 times stiffer. Thus for the first time we have a loudspeaker which behaves as the theoretical ideal of a rigid piston. There is no flexing or break-up distortion within this speaker's frequency range.

- Low frequency resonance in free air: 22 cps.
- Flat response: from 35 to over 15,000 cps.
- Voice Coil Impedance: 15 OHMS.
- Transient response is excellent.

The SYSTEM
The complete LEAK "Sandwich" Loudspeaker System consists of a 7" and 12" moving-coil loudspeaker connected in a full system crossover network housed in a cabinet of unique construction of diamond panel, resonance and gravity. The loudspeaker must be reproduced without the "heavy" distortion of conventional cabinets.

The CABINET
Amazingly enough the remarkable performance of the LEAK "Sandwich" Full-range Loudspeaker System has been achieved with a cabinet measuring only 26" x 15" x 12". This accomplishment of a top quality loudspeaker in the form has been made only an important point when 2" price are used as for others. All 4 sides being finished, the cabinet may be stained, painted or varnished.

★ The Main Leaker... In whom technological awe and amazement can rest assured that the remarkable performance figures have been corroborated by actual listening tests. The MUSICAL performance of this speaker shows an audibly excellent transient response, a noticeable overall smoothness, and a very wide frequency range. ★

Limited supplies available from Leading Dealers... who will arrange demonstrations on request.
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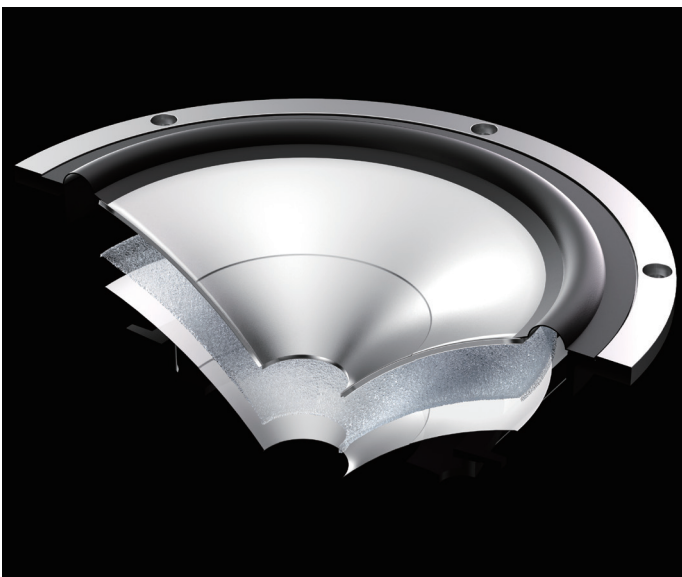
Left LEAK’s founder Harold Leak pictured standing on an original Sandwich speaker cone in a contemporaneous advertisement

Innovation evolved – LEAK's new sandwich cones

63 years on from the introduction of LEAK's innovative cone design, speaker designers continue to face the same challenge: how to make driver cones both very light and extremely stiff. Whilst many new materials and construction techniques have been applied to loudspeaker cones since, the sonic shortcomings caused by less-than-optimal stiffness remain inherent in most direct radiator speaker systems that use conventional cones, irrespective of cost.

LEAK's sandwich cone construction, then, is as relevant now as it was in the 1960s. The new Sandwich 150 and Sandwich 250 speakers update the concept using modern materials, design technologies and manufacturing techniques, incorporating a stiff aluminium skin for the outer surfaces (where the stresses are greatest) bonded to a core of aircraft-grade polymethacrylimide (PMI) structural foam.

This precision-engineered use of ideal materials in optimal proportion and position delivers immense rigidity, ensuring the cone reproduces the signal applied to the voice coil with great accuracy, free from mechanical break-up and its associated distortions. The result is a remarkably smooth frequency response, avoiding sharp peaks or troughs over a very broad frequency range.



Left LEAK has modernised the original Sandwich cone concept with a layer of aircraft-grade structural foam between aluminium 'skins'

Classic ingenuity re-engineered for the modern age

The original LEAK Sandwich speakers were designed when vinyl and valve amps ruled the high-fidelity sound waves. The requirements of modern-day speakers are quite different: today's solid-state amps deliver far greater power, and modern speakers require power handling to match. The demands placed on frequency response by modern digital recordings and sources, especially at the extremes of bass and treble, are also quite different to the midrange-focused vinyl and turntables of the 1960s.

The new LEAK Sandwich 150 and Sandwich 250 are ideally adapted to these requirements. Both are standmount speakers, the former a two-way design with a height of 41.5cm and the latter a much larger three-way model standing 65.5cm tall. They are perfectly suited to a wide range of amplifiers and deliver excellent frequency and transient response – exceptional for speakers of their class.

The Sandwich 150 incorporates a 30mm textile-dome tweeter and a mid/bass driver with a 170mm Aluminium-Foamcore Sandwich cone, while the Sandwich 250 combines the same tweeter with 280mm bass and 108mm midrange drivers, both of which feature Aluminium-Foamcore Sandwich cones. The treble unit includes a damped rear chamber to absorb the output from the back of the 30mm dome, isolating it from the rest of the loudspeaker and reducing its resonant frequency to below the crossover region. This allows bass, mid and high frequencies to be sewn seamlessly together with an added dimension of detail and harmonics, via a crossover network developed using sophisticated computer analysis and hundreds of hours of listening tests.

The LEAK Sandwich 150 and Sandwich 250 are supplied in matched, mirror-imaged pairs, with the treble unit (and midrange unit, in the case of the 250) offset from centre. With one speaker optimised for the left channel and the other for the right, precise stereo imaging within a deep, broad soundstage is assured when sited appropriately.



Left The new Sandwich 250 speaker is considerably taller and wider than the Sandwich 150, incorporating a larger bass driver and dedicated midrange unit

The cabinet walls are sandwiches too

The enclosure is a critical part of any loudspeaker system, just as vital as the quality of the drive units. LEAK' s new Sandwich speakers utilise advances in cabinet design and construction during the 60-plus years since the original design to further elevate the speakers' performance to an entirely new level.

In these new speakers, the driver cones are not the only things that benefit from a sandwich construction. The cabinet walls are formed from an outer layer of MDF and an inner layer of high-density particle board – the different densities of these materials help to scatter panel resonances – enhanced by a filling of special glue that bonds the layers and provides resonance-damping properties. This is combined with precisely positioned spot-bracing, together with a specific front-rear brace that echoes the design of the original.

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The cabinets are dual ported at the rear, augmenting the speakers' bass response. The ports' precisely flared design combines with the cabinet to ensure efficient air pressure equalisation, delivering deep, well-defined bass without a hint of 'chuffing'. Specially sourced damping material within the cabinet eliminates cavity resonance and further extends bass response by converting internal air pressure changes from adiabatic to isothermal.

Externally, the new speakers take distinctive design cues from their forbears. When viewed side by side, they are recognisably LEAK Sandwich speakers, but with enhanced build quality and finish in line with modern expectations. Their cabinets are finished in sumptuous walnut wood veneer, painstakingly applied by hand, complemented by aluminium driver trims and an aluminium insert around the edge of the front baffle. The protective grille further enhances the speakers' classic appearance whilst maintaining the highest acoustic standards.

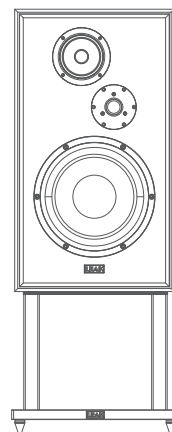
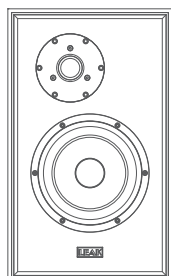
The Sandwich 150 speaker is of a size that will suit many speaker stands, but the dimensions of the Sandwich 250 make it trickier to find a stand to match. For this reason, LEAK has created a dedicated stand for the larger model, constructed from high-carbon steel with an acoustically damped, walnut-veneered base and stainless-steel spikes, plus spike seats for hard floors. The stand ensures the Sandwich 250 is elevated to the ideal height for seated listening and manages the unwanted effects of vibrations and sound reflections.

The LEAK Sandwich 150 and Sandwich 250 speakers are available from mid-February at RRP's of £ 999 and £ 1,999 per pair respectively. If a customer wishes to purchase the dedicated floor stands with the Sandwich 250, the combined RRP is £2,299.

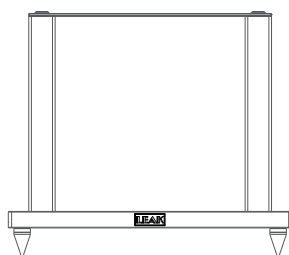


Left LEAK has modernised the original Sandwich cone concept with a layer of aircraft-grade structural foam between aluminium 'skins'

SPECIFICATIONS



Model	LEAK SANDWICH 150	LEAK SANDWICH 250
Configuration	Two-way standmount	Three-way standmount
Enclosure type	Bass reflex (2x rear-firing ports)	Bass reflex (2x rear-firing ports)
Treble driver	30mm coated textile dome	30mm coated textile dome
Midrange driver	N/A	108mm Aluminium-Foamcore Sandwich cone
Bass driver	170mm Aluminium-Foamcore Sandwich cone	280mm Aluminium-Foamcore Sandwich cone
Sensitivity (2.83V @ 1m)	86.5dB	88.5dB
Recommended amp power	25-150W	25-250W
Nominal impedance	6Ω (8Ω compatible)	6Ω (8Ω compatible)
Bass extension (-6dB)	38Hz	32Hz
Crossover frequency	2.4kHz	470Hz; 3.1kHz
Cabinet volume	19.6L	2.7L; 45.5L
Dimensions (HxWxD)	415x250x290mm	655x370x300mm (stand 375x430x362mm)



Model	LEAK SANDWICH 250 STANDS
Material	Carbon steel
Dimensions (HxWxD)	375 x 430 x 362mm