

THE REFERENCE HiFi Speakers



Now with Metamaterial Absorption Technology

The Reference has continually set the benchmark for loudspeakers since its launch in 1973. The perfect reproduction of recorded sound is what The Reference has always stood for. Pioneering the use of digital technologies to achieve the highest audio accuracy, every pair of The Reference series can be matched within half a decibel to the laboratory-maintained reference standard. Exact pair matching delivers perfect stereo reproduction, so these revolutionary speakers won acclaim for the superior acoustic precision. Hence the method became the name: The Reference.

Since the first generation, The Reference has been continuously enhanced by new innovations and technological developments. In the latest evolution, The Reference incorporates our latest innovation: Metamaterial Absorption Technology¹ (MAT™) and continues to be the supreme expression of KEF's philosophy, where advanced engineering meets inspired design.

The Reference are loudspeakers for serious audiophiles who aspire to the perfect enjoyment of music and movies. Whether used in a traditional two-channel HiFi or a multi-channel home theatre, listeners will be able to experience the realistic, immersive sound with breath-taking dynamics, and levels of accuracy that reveal details never noticed before.

A class apart

The Reference range encompasses two three-way floorstanding speakers, a formidable three-way standmount speaker, and two three-way centre speakers that can be used as Left-Centre-Right (LCR) speakers. The Reference combines phenomenal high-fidelity performance with complete multi-channel versatility.

And now new technological advances make The Reference range even more impressive. At the heart of The Reference range now sits a bespoke 12th generation Uni-Q with MAT driver array. This new addition truly puts The Reference range in a class of its own.

Revolutionary sound absorption with MAT™

A truly revolutionary tool in the KEF acoustic armoury, Metamaterial Absorption Technology (MAT) is a highly complex maze-like structure, where each of the intricate channels efficiently absorbs a specific frequency. When combined, the channels act as an acoustic black hole, absorbing 99% of the unwanted sound that comes from the rear of the tweeter, eliminating the resulting distortion and providing a purer, more natural acoustic performance.

A result of joint development with the Acoustic Metamaterials Group, using MAT breaks completely new ground in loudspeaker design, and once again demonstrates KEF's unrelenting passion for developing new technologies to improve your listening experience. Metamaterials are specially developed structures that use existing materials in such a way that they exhibit new, desirable properties that are simply not found in naturally occurring substances.

12th Generation Uni-Q with MAT™ delivers

The 12th generation Uni-Q with MAT in The Reference is a bespoke driver array engineered to deliver pristine performance across this exceptional range of loudspeakers. It's the result of decades of accumulated in-house knowledge and the application of cutting-edge simulation and analysis tools. The developments are many and all play a part in The Reference's pristine performance.

As a starting point, KEF engineers re-engineered the tweeter gap damper to maximise the space at the back of the tweeter for the new metamaterial absorber. Optimising the cavity shape and strategically placing two rings of porous material effectively tame the resonances and imperfections, thus greatly improving detail and clarity.

A new ultra-low distortion midrange motor design uses a copper ring embedded into the motor gap to minimise inductance and variation of inductance with coil position. This lowers the midrange THD and reduces thermal compression, leading to improved efficiency.

The Uni-Q driver array is fully decoupled to prevent unwanted vibrations from muddying the sound. A new flexible decoupling chassis is designed to reduce vibration and remove coloration. It ensures that any vibration generated by the mid and high-frequency motor system is not transmitted to the loudspeaker cabinet.

Summary of features

- Metamaterial Absorption Technology eliminates 99% of high-frequency distortion for pure, natural sound
- Bespoke 12th generation Uni-Q with MAT driver array for exceptional acoustic accuracy
- Enhanced crossover design fine-tuned the signal path for maximum clarity
- Optimised cabinet design for best acoustic performance
- Five models: Reference 1 Meta, Reference 3 Meta, Reference 5 Meta, Reference 2 Meta, Reference 4 Meta
- Available in 5 finishes
- With mounting inserts to secure on KEF S-RF1 Floor Stand (available as separate item)
- The Reference Series Grille set for each model is available as separate item



¹ Metamaterial Absorption Technology is a joint development with Acoustic Metamaterials Group.

A new driver surround is designed to allow longer excursion without causing diffraction and extending the frequency range of the mid-frequency. Plus, the contours of the dome, midrange horn and surround are all computer-optimised to ensure a perfectly smooth transition to the cabinet.

KEF's patented tangerine waveguide technology manages the airflow to recreate the wide, even spread of a natural sound field, dispersing the astonishingly pure high-frequency imaging throughout the room.

The result of these innovations and developments is that this bespoke 12th generation Uni-Q with MAT offers a sound that is more transparent and life-like than previously possible.

Reference quality bass

High and mid-range frequencies are only part of the story though, and The Reference is also blessed with clean, rich, highly articulate bass. That's because The Reference's 165mm (6.5 inch) low frequency driver perfectly complements the new 12th generation Uni-Q with MAT driver array. Smart engineering and meticulous attention to design detail enables the bass to blend seamlessly with the immaculate midrange and treble response.

The Reference's bass driver also benefits from a massive, vented magnet assembly, a large aluminium voice coil and an exceptionally light and stiff alloy cone. As a result of all these technologies volume, dynamics and power handling are superb.

Engineered to be flexible

The speakers in The Reference range are also welcomingly undemanding in terms of positioning, and are easy to fine-tune for your listening area by using KEF's innovative Flexible Port Technology, which can reduce port resonance. There are two options of port tubes, allowing users to modify the sound to suit their room. Plus, the flare and profile of each port has been calculated by computational fluid dynamics to avoid turbulent air noise that might colour the sound, another part of the complex jigsaw that is The Reference's breath-taking performance.

Total attention to detail

Every speaker in The Reference range exudes the sense of sheer quality that comes from being hand-built by KEF's master craftsmen in Maidstone, Kent, UK. They are designed to be acoustically exceptional, attractive to look at, and each speaker is meticulously built to KEF's exceptional standards.

All the cabinets are designed using finite element analysis to determine the ideal shape and bracing geometry to minimise secondary radiation from the sides, with Constrained Layer Damping applied to turn what little vibration is left into heat.

Furthermore, the expertly engineered cabinets are finished in a sumptuous high-gloss or richly detailed, pair-matched wood veneers to complement the strikingly distinctive front baffle, which is designed to eliminate anomalies caused by diffraction. Five finishes are available, a combination of three cabinet finishes and five drive unit colours: Satin Walnut/Silver, High-Gloss White/Blue, High-Gloss White/Champagne, High-Gloss Black/Grey, High-Gloss Black/Copper.



Satin Walnut/
Silver



High-Gloss White/
Blue



High-Gloss White/
Champagne



High-Gloss Black/
Grey



High-Gloss Black/
Copper



Specifications

Model	REFERENCE 1 Meta	REFERENCE 3 Meta	REFERENCE 5 Meta
Design	Three-way bass reflex	Three-way bass reflex	Three-way bass reflex
Drive units	Uni-Q driver array: HF: 25 mm (1 in.) aluminium dome with MAT MF: 125 mm (5 in.) aluminium cone Bass units: LF: 165 mm (6.5 in.) aluminium cone	Uni-Q driver array: HF: 25 mm (1 in.) aluminium dome with MAT MF: 125 mm (5 in.) aluminium cone Bass units: LF: 2 x 165 mm (6.5 in.) aluminium cone	Uni-Q driver array: HF: 25 mm (1 in.) aluminium dome with MAT MF: 125 mm (5 in.) aluminium cone Bass units: LF: 4 x 165 mm (6.5 in.) aluminium cone
Frequency range free field (-6dB)	Short port: 40 Hz - 45 kHz Long port: 37 Hz - 45 kHz	Short port: 38 Hz - 45 kHz Long port: 35 Hz - 45 kHz	Short port: 35 Hz - 45 kHz Long port: 32 Hz - 45 kHz
Frequency range typical in room bass response (-6dB)	30 Hz	28 Hz	25 Hz
Frequency response (± 3 dB)	45 Hz - 35 kHz	43 Hz - 35 kHz	40 Hz - 35 kHz
Crossover frequency	450 Hz, 2.1 kHz	450 Hz, 2.1 kHz	450 Hz, 2.1 kHz
Amplifier requirements	50 - 200 W	50 - 300 W	50 - 400 W
Sensitivity (2.83V/ 1m)	85 dB	86 dB	88 dB
Harmonic distortion 2 nd & 3 rd harmonics (90dB, 1m)	<0.5% 40 Hz - 100 kHz <0.2% 200 Hz - 2 kHz <0.1% 2 kHz - 20 kHz	<0.5% 40 Hz - 100 kHz <0.2% 200 Hz - 2 kHz <0.1% 2 kHz - 20 kHz	<0.5% 40 Hz - 100 kHz <0.2% 200 Hz - 2 kHz <0.1% 2 kHz - 20 kHz
Maximum output (peak sound pressure level at 1m with pink noise)	111 dB	113.5 dB	116 dB
Impedance	4 Ω (min. 3.2 Ω)	4 Ω (min. 3.2 Ω)	4 Ω (min. 3.2 Ω)
Weight	18.2 kg (40.1 lbs.)	51.3 kg (113.1 lbs.)	60.2 kg (132.7 lbs.)
Dimensions (H x W x D) (with grille and terminal)	440 x 205 x 422 mm (17.3 x 8.1 x 16.6 in.)	1155 x 205 x 462 mm (45.5 x 8.1 x 18.2 in.)	1350 x 205 x 462 mm (53.1 x 8.1 x 18.2 in.)
Dimensions (H x W x D) (with grille, terminal & plinth)	N/A	1207 x 323 x 467 mm (47.5 x 12.7 x 18.4 in.)	1402 x 323 x 467 mm (55.2 x 12.7 x 18.4 in.)
Standard finishes	Satin Walnut/Silver, High-Gloss White/Blue, High-Gloss White/Champagne, High-Gloss Black/Grey, High-Gloss Black/Copper		



Model	REFERENCE 2 Meta	REFERENCE 4 Meta
Design	Three-way closed box	Three-way bass reflex
Drive units	Uni-Q driver array: HF: 25 mm (1 in.) aluminium dome with MAT MF: 125 mm (5 in.) aluminium cone Bass units: LF: 2 x 165 mm (6.5 in.) aluminium cone	Uni-Q driver array: HF: 25 mm (1 in.) aluminium dome with MAT MF: 125 mm (5 in.) aluminium cone Bass units: LF: 4 x 165 mm (6.5 in.) aluminium cone
Frequency range free field (-6dB)	65 Hz - 45 kHz	Short port: 43 Hz - 45 kHz Long port: 40 Hz - 45 kHz
Frequency range typical in room bass response (-6dB)	46 Hz	33 Hz
Frequency response (± 3 dB)	80 Hz - 35 kHz	48 Hz - 35 kHz
Crossover frequency	450 Hz, 2.1 kHz	450 Hz, 2.1 kHz
Amplifier requirements	50 - 300 W	50 - 400 W
Sensitivity (2.83V/ 1m)	86 dB	88 dB
Harmonic distortion 2nd & 3rd harmonics (90dB, 1m)	<0.5% 40 Hz - 100 kHz <0.2% 200 Hz - 2 kHz <0.1% 2 kHz - 20 kHz	<0.5% 40 Hz - 100 kHz <0.2% 200 Hz - 2 kHz <0.1% 2 kHz - 20 kHz
Maximum output (peak sound pressure level at 1m with pink noise)	113.5 dB	116 dB
Impedance	4 Ω (min. 3.2 Ω)	4 Ω (min. 3.2 Ω)
Weight	22.8 kg (50.3 lbs.)	45.2 kg (99.6 lbs.)
Dimensions (H x W x D) (with grille and terminal)	205 x 630 x 335 mm (8.1 x 24.8 x 13.2 in.)	205 x 1090 x 463 mm (8.1 x 42.9 x 18.2 in.)
Dimensions (H x W x D) (with grille, terminal & plinth)	N/A	N/A
Standard finishes	Satin Walnut/Silver, High-Gloss White/Blue, High-Gloss White/Champagne, High-Gloss Black/Grey, High-Gloss Black/Copper	