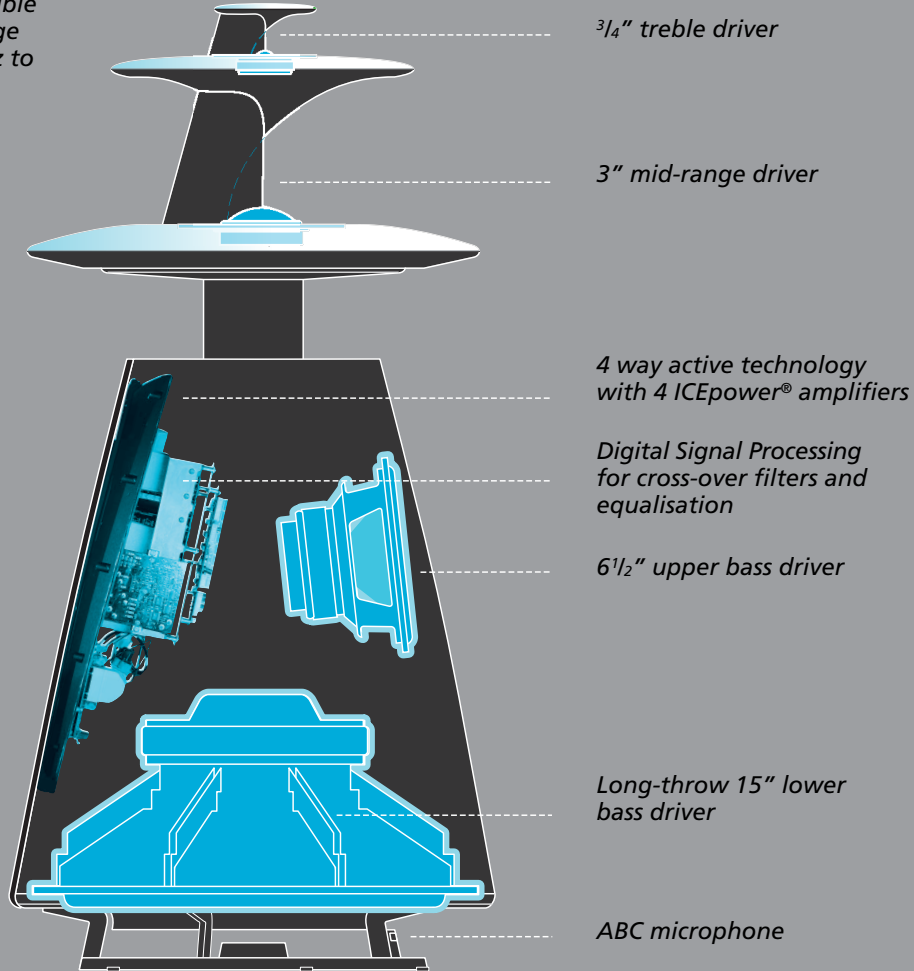


*BeoLab 5
reproduces the
entire audible
sound range
from 20 Hz to
20000 Hz*



3/4" treble driver

3" mid-range driver

*4 way active technology
with 4 ICEpower® amplifiers*

*Digital Signal Processing
for cross-over filters and
equalisation*

6 1/2" upper bass driver

*Long-throw 15" lower
bass driver*

ABC microphone

BeoLab 5

Breaking radically with conventions of design, performance and applied technology, BeoLab 5 establishes a new paradigm in domestic sound reproduction.

The concept of BeoLab 5 is to provide an ambitious answer to the question of wanting something very specific from a loudspeaker, namely superior sound and freedom of use.

Freedom in where to place a loudspeaker. Freedom in listening position. Freedom from noise and distortion. Freedom to turn up the volume. Freedom to experience what is probably the closest-to-real-life sound ever reproduced by a domestic loudspeaker concept.

The BeoLab 5 loudspeaker concept distinguishes itself through a wide range of unique innovations and technologies, the most prominent being:

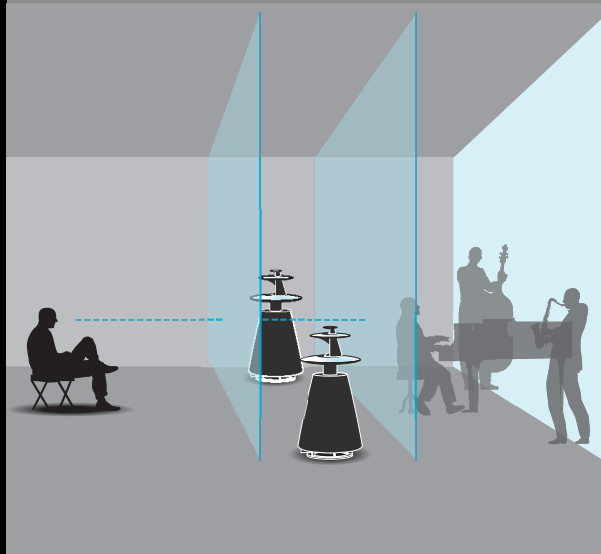
- Acoustic Lens Technology – ALT*
- Adaptive Bass Control – ABC

- Digital Signal Processing – DSP
- ICEpower®, digital amplification

These technologies constitute BeoLab 5 as Bang & Olufsen's first commercially available, all-digital loudspeaker concept. BeoLab 5 supports the visionary role held by Bang & Olufsen for more than 75 years, which combines emotional experience and technological excellence.

* ALT (or Acoustic Lens Technology) is licenced from Sausalito Audio Works LLC

1 The Cube. Measuring 12X12X13 meters, the Cube's dimensions are necessary to carry out advanced free field acoustic measurements. The size of the Cube enables measurements to be carried out before reflections from walls, ceiling and floor can influence the results.

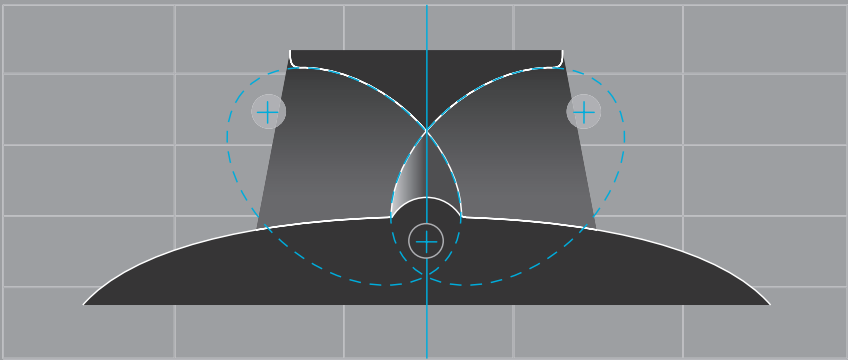
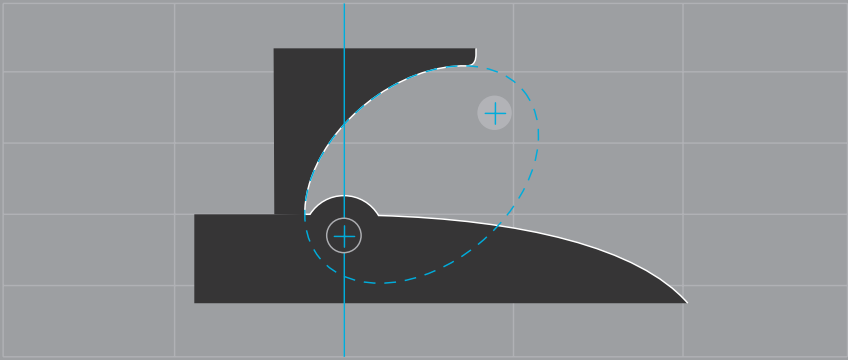


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2 The Listening Panel. The Listening Panel is a strategic component among Bang & Olufsen's competences. The panel, consisting of 10 people, conducts ongoing blind-listening sessions, where they evaluate and describe all acoustic innovations and concepts – including concepts marketed by other manufacturers.

Besides certified normal hearing, the panel have the ability to repeatedly distinguish auditory events and rate listening experiences consistently. Their individual taste is irrelevant.





Ellipse. The Acoustic Lens Technology is based on the unique characteristics of an ellipse. The acoustic center of the driver is placed at the lower focal point of the ellipse. All sound emitted from the driver will converge simultaneously at the upper focal point, as the distance between focal points via the perimeter is the same in all directions. The result is the creation of a "virtual" treble driver at the upper focal point. Furthermore, the ellipse is rotated to form a 3 dimensional structure, the lens, resulting in a uniform distribution of sound in the horizontal plane with 180° of dispersion.

ALT Acoustic Lens Technology

The quality of listening shouldn't depend on you being in a specific position in the room. The tonal balance should be the same, regardless of listening position – static or dynamic. This is the fundamental demand that the Acoustic Lens Technology (ALT) responds to.

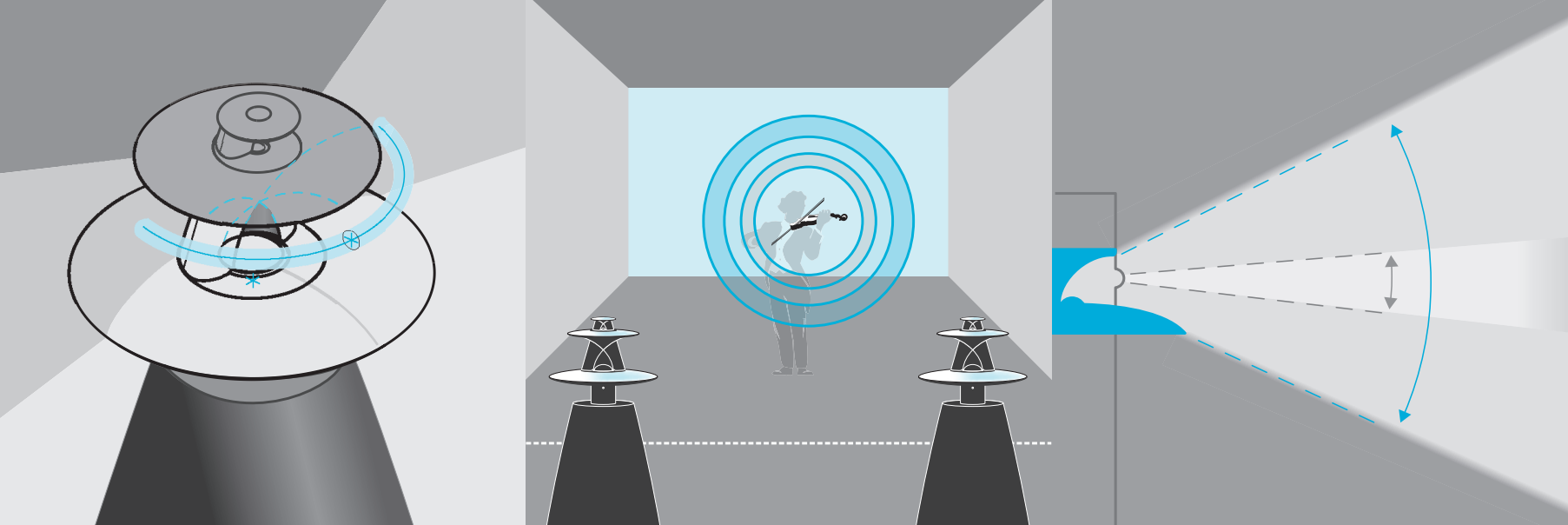
For decades, controlling the directivity and dispersion of particularly the higher frequencies has been a key concern for loudspeaker designers worldwide. The ability to control the higher frequencies is crucial, as they carry the majority of sonic information about what you are listening to, and where it is located.

The benefit of ALT is a 180° horizontal dispersion, leading to uniform sound characteristics in the area in front of the loudspeaker. This enables the listener to move around or sit in different places, while experiencing constant timbre.

Both the mid-range driver and the treble driver of BeoLab 5, covering frequencies from 600 Hz to 20000 Hz, utilise ALT, giving BeoLab 5 its distinct visual appearance. The size and shape of the ALT discs, serving as horizontal baffles, are accurately calculated to match the exact frequency spectrum covered by each driver.

ALT provides numerous benefits, including;

- maximised area in front of the loudspeaker with optimum sound
- constant tonal balance, both from direct and reflected sound
- minimised floor and ceiling reflection
- improved sense of space
- improved sense of realism



1 2

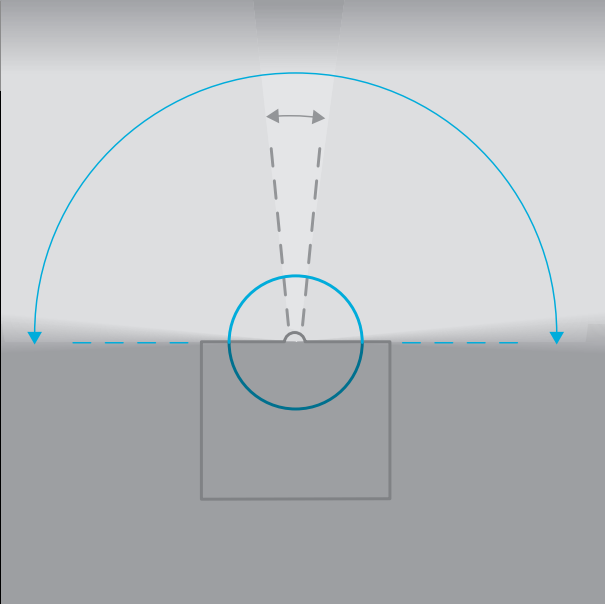
1 2 Comparison test. *Timbre and spaciousness are the key issues when judging the quality of reproduced sound. Every effort is applied to control and optimise these parameters, and their sub-parameters.*

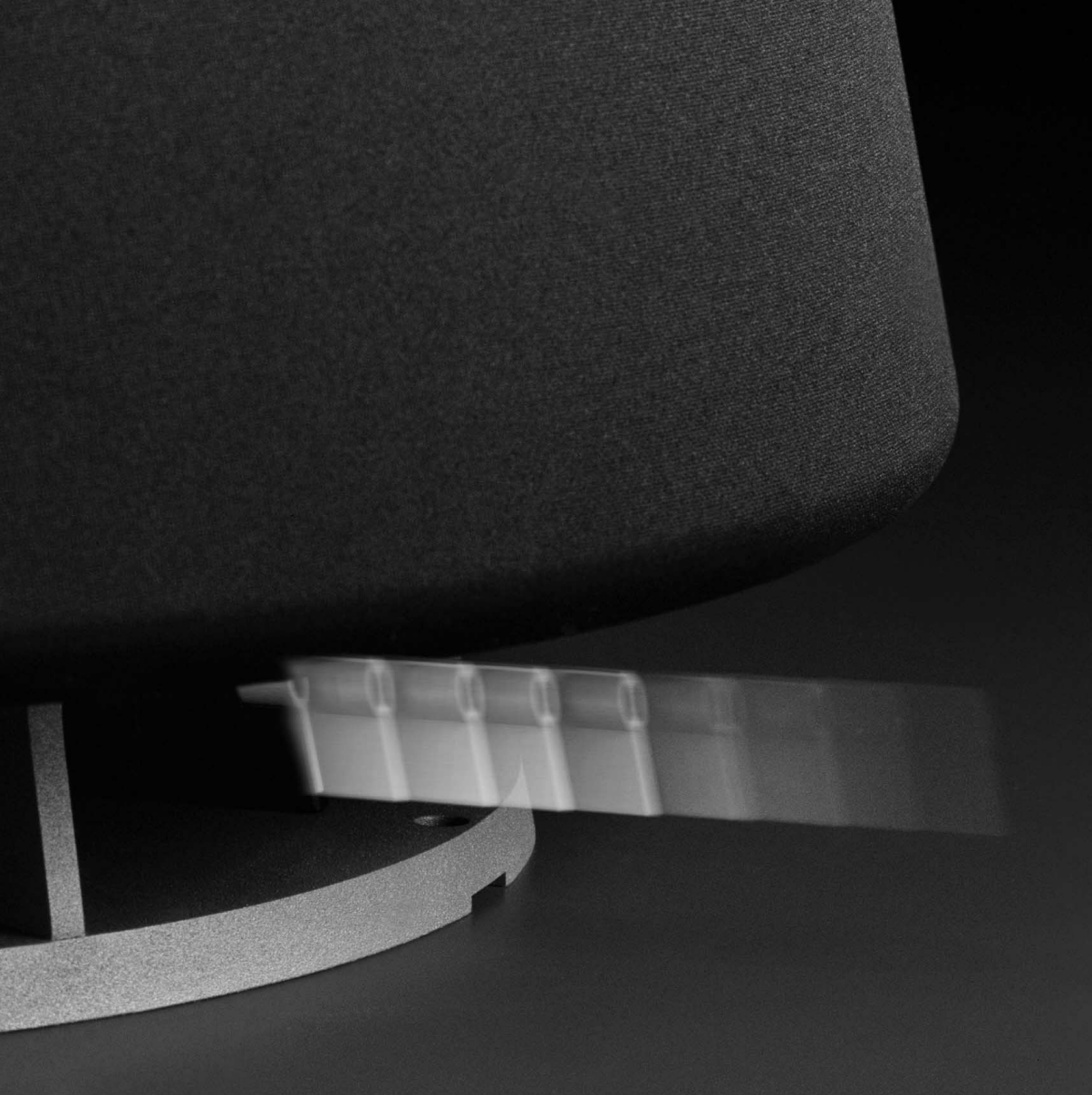
Timbre is often described as tonal colour. The objective when working with timbre is to get “sounds to sound right”. A violin is not just any string instrument – it’s a violin. Working with timbre, from a loudspeaker design point of view, the goal is to make sure all the tonal characteristics are reproduced unchanged.

Spaciousness, on the other hand, is about “where” the sound is. Is the violin being played in a small room, a hall, or perhaps, outdoors. Is it located in front or behind the other instruments? In blind comparison tests, involving other high-end reference loudspeakers, the Listening Panel has never given any loudspeaker a higher rating than BeoLab 5.

1 2

1 2 ALT vs. conventional loudspeaker design. *Acoustic Lens Technology, ALT, is an acoustic design that addresses the treble directivity of a loudspeaker. At high frequencies, a standard loudspeaker driver mounted in a vertical baffle will give a focused beam of sound, causing the sound to be different in different locations: in the “beam” sound is often too powerful, while sound almost disappears to both sides. ALT provides a unique 180° horizontal dispersion with controlled vertical directivity.*





ABC Adaptive Bass Control

The Bang & Olufsen patented Adaptive Bass Control (ABC) is the intelligent solution to the fact that a loudspeaker's performance is strongly influenced by its physical position in the room where it is used.

With ABC, BeoLab 5 is able to identify itself as part of the acoustic environment, taking its own position, the room and the interior into consideration, and subsequently adapting to it.

Using a digital calibration method, based on an integrated microphone and software analysis, the loudspeaker calculates accurate correction filtering to optimise its performance.

The calibration procedure is user operated and should be carried out whenever the individual loudspeaker is moved to a new

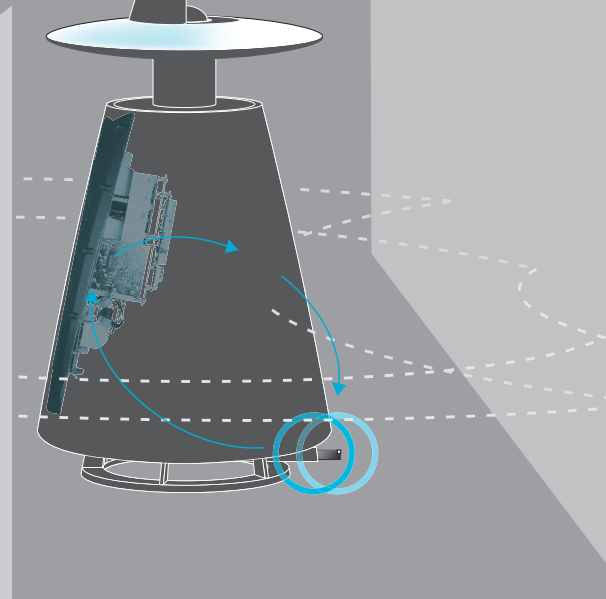
position, or, after major changes in furnishing layout, ensuring reference quality in sound reproduction is obtained at all times.

The key benefit of ABC is user freedom to unrestricted placement of the individual loudspeaker in any room, regardless of shape, size and material, while clarity and timbre is not degraded. Of course, as calibration is made for each loudspeaker, optimised asymmetric positioning is possible, e.g. one loudspeaker in a corner positioning, while another is free standing or close to a wall.



Loudspeakers in a room. Walls, floors and ceilings act as acoustic boundaries resulting in reflections that create sonic mirror images of the loudspeaker. These cause alterations in the total power produced by the loudspeaker and the room in conjunction, compared to the original signal. Some of these changes are perceived positively, as they provide subtle, audible sensation of the room, its dimensions and character.

ABC ensures the sound level changes induced by the room in the low end of the frequency spectrum are measured and corrected. Applying ABC can be compared to the use of a 121 band equaliser to design a place-specific filter design for the frequencies between 20 and 400 Hz. Full timbral quality is the result, regardless of loudspeaker position.



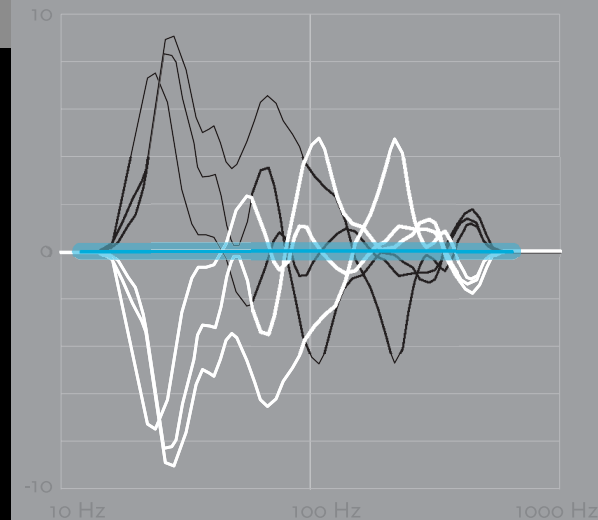
1 Measuring the room. The basis of ABC is the acoustical radiation resistance, a technical term for the sound fingerprint of the room as seen by the loudspeaker. A series of calibration sounds, from 20 to 300 Hz are generated, and the microphone situated at the front lower edge of BeoLab 5 collects data during two measurements, and compares the data to reference data embedded in BeoLab 5. Digital error correction makes sure speech or other sounds occurring incidentally during calibration are not reflected in the data assembly and analysis.

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2 Placement and power response. Some changes inflicted by the room have adverse effects on the timbre. These effects do not occur evenly across frequencies, their magnitude depends on the loudspeaker position.

Some frequencies gain power by a factor of 10, while others are actually suppressed by the same amount. The illustration shows the performance in 3 different positions in a room, with varying effects on the power response (grey lines). To maintain the quality of the original signal, ABC calculates the appropriate filtering (white lines).

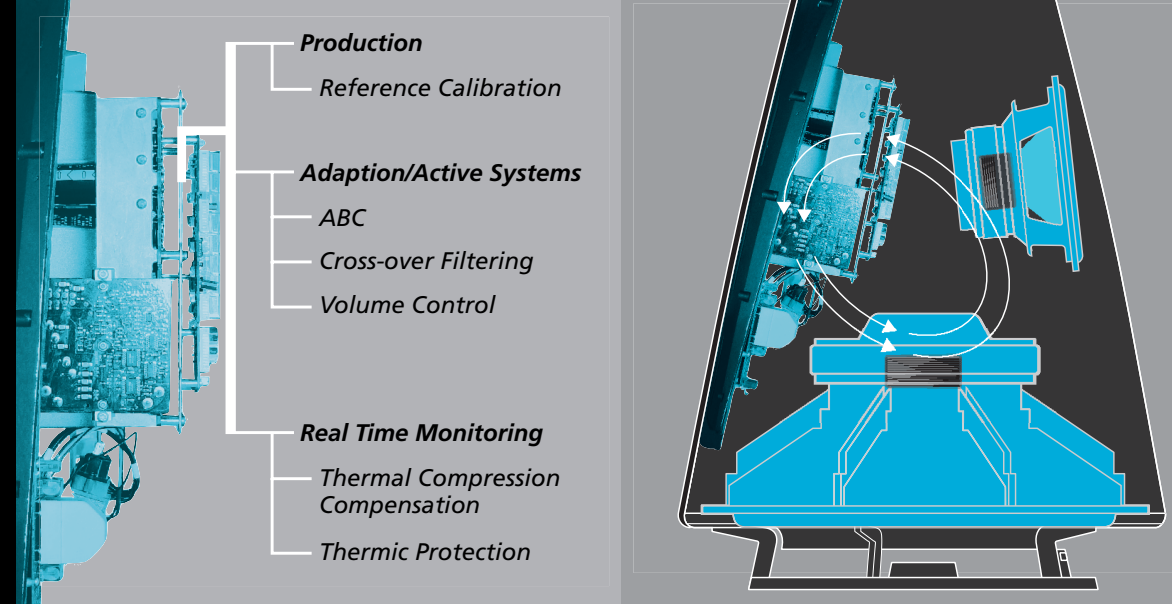


DSP Digital Signal Processing

Whereas analogue loudspeakers inherently lack the ability to ever change once they have been built, BeoLab 5 is based on an all-digital platform, making it “alive” and able to react to various events, through automatically re-programming its software. Consequently, BeoLab 5 is able to optimise its “personality” to both new physical locations and to changing situations during active use.

The Digital Signal Processing platform (DSP) makes a difference already as BeoLab 5 leaves final assembly. All elements, such as cabinet, cross-over filters, amplifiers and drivers, are optimised to match one another. Finally, software adjustments make sure that each single loudspeaker is calibrated against a reference, accepting deviations only within a frame of +/- 0.25 dB. This means all BeoLab 5 loudspeakers are virtually identical – at least until the user calibrates the loudspeaker via ABC, and thereby asks for a “personalised identity”.

The dedicated processors, comparable in capacity to a personal computer, enable BeoLab 5 to be adaptive to both the physical and technical aspects of the environment. Many of these tasks are invisible to the user, yet highly relevant for the experience. One such task is constant monitoring of the thermal conditions in all BeoLab 5’s circuitry.



1 2

1 DSP overview. Digital Signal Processing, in brief DSP, is the generic headline for a range of software based innovations, responsible for a level of performance and safety, that cannot be obtained by a loudspeaker on an analogue platform. The features are all physically integrated in processors mounted on the “engine module” of BeoLab 5, an aluminium structure holding both the amplifier modules and power supply.

2 Thermal Compression Compensation. Playing at high volume for long periods of time causes ordinary loudspeaker designs to decrease output significantly and synchronously decrease timbral quality. The warmer it gets, the worse it performs. This happens because the electrical resistance of the voice coils increase along with increase in temperature.

With Thermal Compression Compensation, dedicated software monitors the temperature gain, and counteracts any response changes by applying the necessary corrective filtering. If, however, maximum temperature is reached after excessive exposure to extreme signals, the Thermal Protection System makes sure the signal level is automatically reduced to prevent driver units and voice coils being damaged.



ICEpower® Intelligent, Compact and Efficient audio power

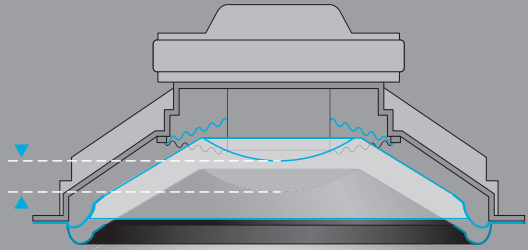
The ICEpower® is a patented technology of Bang & Olufsen, combining extremely high energy efficiency, ultra compactness and superior sound quality.

Each BeoLab 5 incorporates a total of 2,500 watts of power, provided by four built-in ICEpower® amplifiers: A 1,000 watt ICEpower® amplifier for the lower bass, another 1,000 watt ICEpower® amplifier for the upper bass, and 250 watts ICEpower® amplifiers each for the mid-range and the treble drivers. They ensure that adequate power is present and ready to handle even the most demanding situations.

While conventional analogue (class AB) amplifiers convert an average of only 10% of the input power to actual output power to the speaker units (the remaining 90% is wasted as heat), ICEpower®'s efficiency is above 90%, thus making it possible to build compact amplifiers with significantly higher output power and cool operation. The need for a heat sink is thereby reduced

drastically, and the related ability to control the thermal environment supports the stability and long-term reliability of the electronic circuitry.

The massive dimensioning of BeoLab 5's amplification results in adequate power to, smoothly and safely, drive BeoLab 5 to "concert hall" peak sound pressure levels of 115 to 120 dB. For domestic use, it is considered unlikely that anyone would require performance in excess of this level. This makes BeoLab 5 one of the most powerful active loudspeaker concepts ever made commercially available for the domestic consumer.



1 Lower bass driver. 2500 watts of amplification power is normally related to PA systems, however, the immense power from the ICEpower® amplifiers is necessary to handle a non-compromising bass performance. BeoLab 5's long-throw 15" lower bass driver has a linear excursion of 21 mm each way (in/out), and is able to pump 1.8 litres of air per stroke. Powered by a separate 1000 watt ICEpower® amplifier, it performs to as low as 12 Hz, and makes use of additional subwoofer systems, e.g. in a home cinema setting, unnecessary.

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2 ICEpower® amplification modules. In the case of BeoLab 5, the integrated ICEpower® amplification also means a very compact design. To achieve the same level of sound pressure with a passive loudspeaker design would require a cabinet size three to four times bigger than that of BeoLab 5. In fact, without the ICEpower® technology, BeoLab 5 would have remained an unrealised ambition. Bang & Olufsen ICEpower® technology is available for other audio companies, including manufacturers of professional studio recording equipment.



HANDCRAFTED SOUND

BeoLab 5 is crafted in anodised aluminium with acoustic lenses in matt black and brushed aluminium. The loudspeaker rests on a circular and adjustable foot in structure-painted aluminium giving it an elegant yet robust impression. The cabinet containing the bass drivers is covered in black cloth. The heat sink at the back of the loudspeaker is made from cast aluminium. The total weight of BeoLab 5 is 61 kg.

Despite the fact that BeoLab 5 is Bang & Olufsen's most advanced audio product so far, the manufacturing of BeoLab 5 is largely based on skilled craftsmanship. When it comes to the assembly of the loudspeakers, automated processes are held at a minimum which guarantees each unit a flawless finish. Thus, BeoLab 5 is a natural step in our evolution and builds on all the qualities of our current loudspeaker programme.

All BeoLab 5 loudspeakers are subject to an extended testing procedure including at

least 24 hours acclimatisation of all elements ensuring they have the same temperature as the testing room. BeoLab 5 is placed in the testing room with the help of an air cushion with the purpose of minimising tolerances. Inside the testing room, atmospheric pressure and temperature are continuously monitored so all tests are performed under identical conditions and each driver unit is individually tested and characterised.



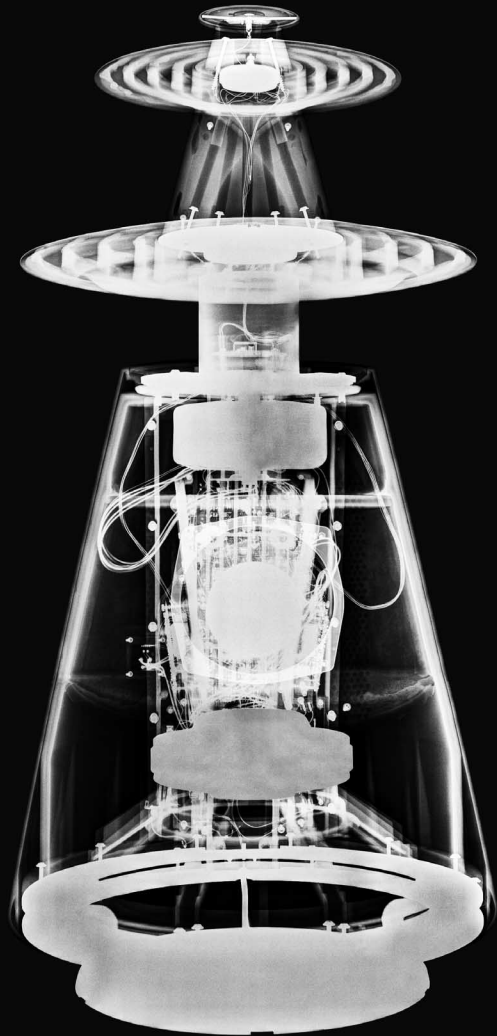
2 Craftsmanship. In order to make the visual appearance of a Bang & Olufsen loudspeaker match its advanced technology and its superior performance, most of the production is carried out by hand. When it comes to the finishing touch, we haven't found an acceptable substitute for the human eye or the human hand.

1 Aluminium. The choice of brushed aluminium for the acoustic lenses allows BeoLab 5 to benefit from a vast experience built up through decades of work with this material. And at the same time, it presents BeoLab 5 in the familiar Bang & Olufsen design language.



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TECHNICAL SPECIFICATIONS

Dimensions / weight	Height 97 cm, Ø 49 cm / 61 kg
Max. sound pressure level	108 dB (stereo, pair)
Power amplifier, treble	250 W, ICEpower®
Power amplifier mid-range	250 W, ICEpower®
Power amplifier upper bass	1000 W, ICEpower®
Power amplifier lower bass	1000 W, ICEpower®
Effective frequency range +/-3dB	20 – 20,000 Hz
Low frequency limit at -10dB	12 Hz
Cabinet principle / net volume upper bass	Sealed box / 5 l.
Cabinet principle / net volume lower bass	Sealed box / 29 l.
Directivity control treble and mid-range	Acoustic Lens Technology*
Treble driver	1.8 cm – 3/4"
Mid-range driver	7.6 cm – 3"
Upper bass driver	16.5 cm – 6 1/2"
Lower bass driver	38 cm – 15"
Digital Signal Processor	32 bit floating point 180 MFLOPS, 512k byte Flash-ROM
Room adaptation	Adaptive Bass Control
Connections	Power Link (2) Phono (line) Digital SPDIF (2)
Volume adjustment	Built-in
Design	David Lewis Design

Subject to change without further notice. For more information on ICEpower® technology, visit www.icepower.bang-olufsen.com

**ALT (or Acoustic Lens Technology) is licenced from Sausalito Audio Works LLC*