# DALI SUB P-10 DSS

## WHITEPAPER


DALI®

IN ADMIRATION OF MUSIC

# INTRODUCTION

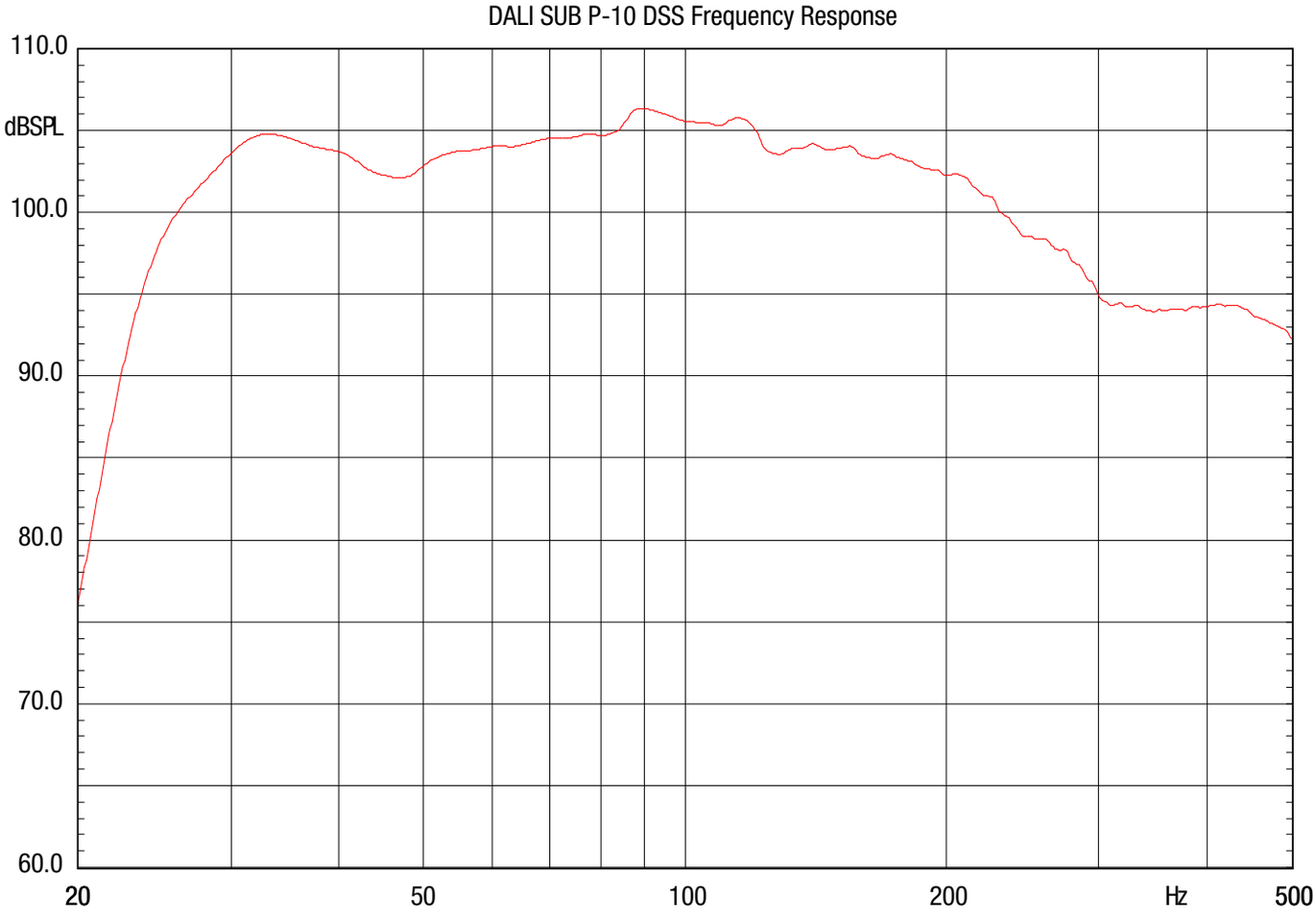
The new DALI SUB P-10DSS is designed with the goal to set standards for subwoofer performance and experience in your listening room or dedicated home theater .

3 x 10 inch long stroke design woofers featuring rigid carbon fiber cones, dual spider, low loss suspension and massive magnets system are shoe-horned into an elegantly styled , compact enclosure and combined with powerful digital amplifier with dynamic output of 500 W RMS.

The P-10DSS remote controlled subwoofer, with individual settings and memory for stereo and theater will be the competent upgrade to high end stereo and home theater systems.

This whitepaper will highlight some of the details of the new DALI SUB P-10 DSS – a product which demonstrates that even subwoofers can be made to render a true DALI experience.

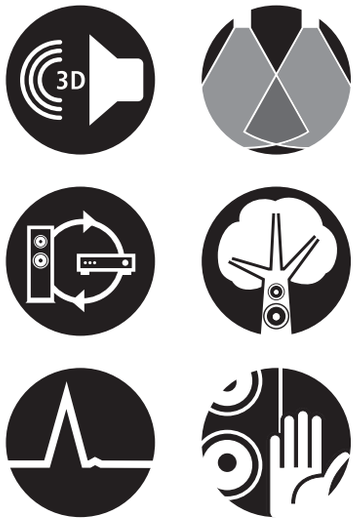
# ACOUSTIC BACKGROUND




*An impressive frequency response for a powerful subwoofer in an extremely compact cabinet. The DALI SUB P-10 DSS is all about high fidelity.*

Unlike many subwoofers in the market the DALI SUB P-10 DSS has been engineered to perform equally well on both music and movies. It is important to us that a subwoofer is capable of rendering a performance true to the input signal. Therefore a DALI subwoofer is everything but a 'boombox'.

Over the years DALI's engineers have developed a set of sound design principles. Today these are applied in the creation of basically any DALI speaker. Naturally our subwoofers must be able to enter into any setup without sacrificing the purpose of providing wide dispersion, time coherent and low-loss performance.



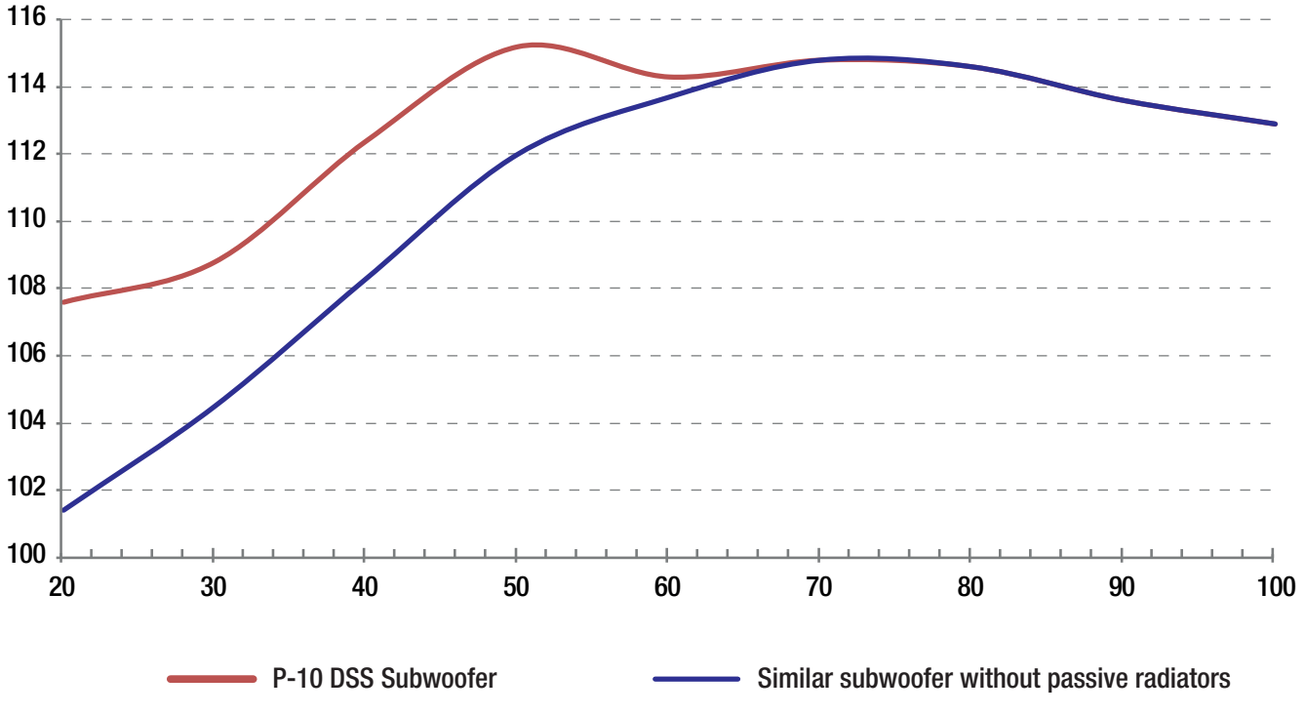

*You can read more about our sound design principles at www.dali-speakers.com*

# CABINET


Designed and constructed from all our knowledge and experience in acoustics, the solid MDF cabinet abides the tough DALI specifications. Measuring only 370 x 340 x 340 mm (HxWxD) the cabinet is extremely compact despite this subwoofers ability to go both loud and deep. There are two finishes available for this enclosure – High Gloss Black and High Gloss White. Both of them feature 10 layers of PE lacquer. And in between, each layer is hand polished to ensure a deep, high gloss and elegant surface.

DALI SUB P-10 DSS features a solid, down-firing woofer, able to move lots of air. To ensure a stable working environment for this woofer the base of the cabinet is made from 25 mm plywood. This guarantees a powerful grip on the driver, eliminating any loss related to the fixation of the woofer itself.

Applying a sleek aluminium base and spacers made from solid aluminium, the entire cabinet is effectively decoupled from the floor. Almost appearing to hover above the floor the distance of 45 mm eliminates any potential turbulence from the space between the cabinet and the floor itself. At the same time the proximity to the floor ensures that the benefit of having a down-firing woofer is maintained; a higher efficiency and a seamless acoustic coupling to the room.

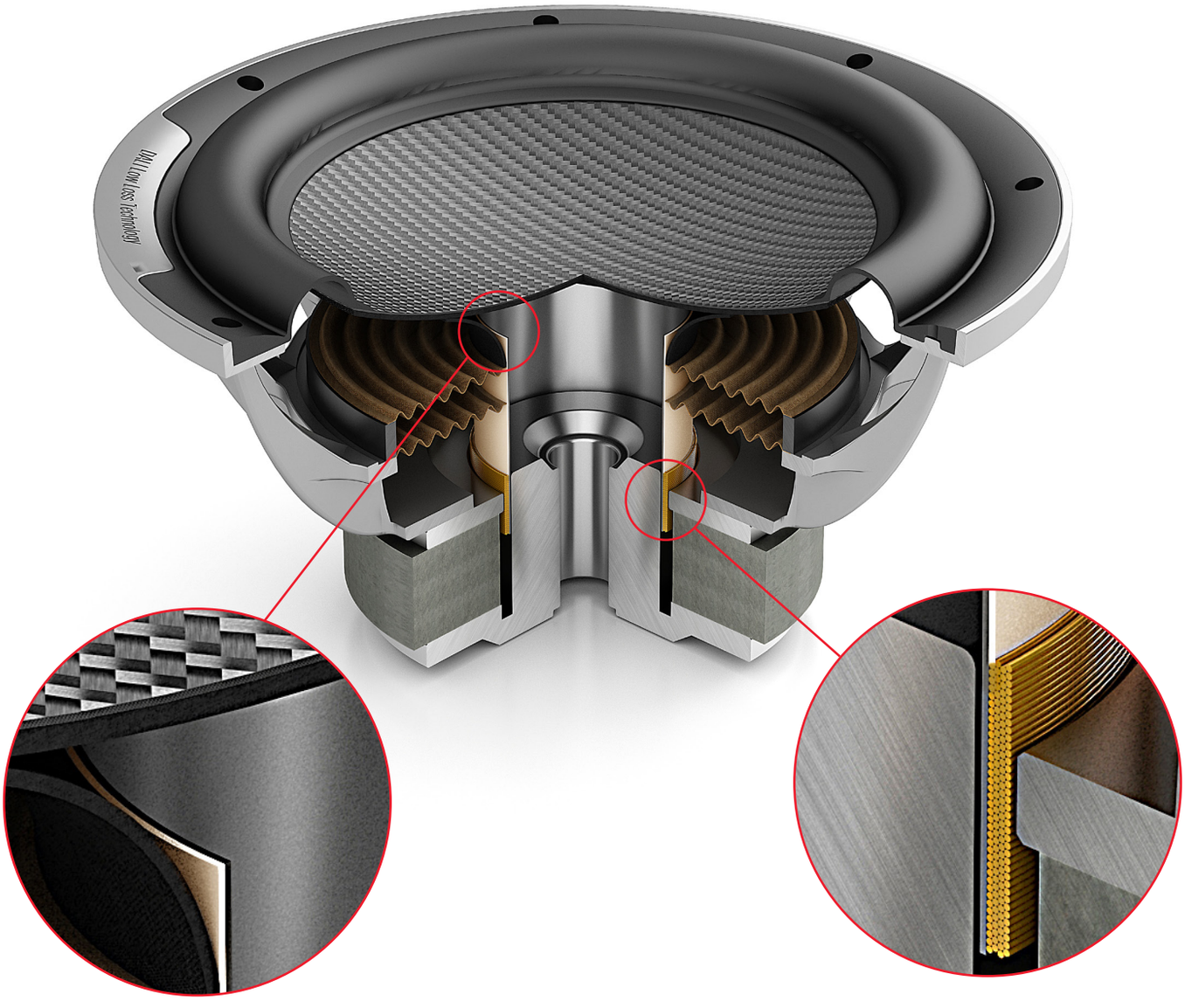



*This graph shows the effects of the passive radiators on the frequency response between the SUB P-10 DSS and an otherwise identical subwoofer with a closed chamber.*


*An example of DALI's meticulous attention to details: Even the screws used for mounting the drivers have been developed especially for this purpose. Also applied in the DALI EPICON series, these screws are self-centring due to the conical head and neck. This eliminates any deformation of the natural rubber surround, ensuring an absolute minimum of mechanical loss.*

*The screw threads have been designed to generate the required level of retention, taking both the driver and the cabinet material into consideration.*

*Even the sharp point typically found on screws for this purpose has been eliminated. All to ensure that our production workers are not hurt when assembling the DALI P-10 DSS.*




In order to achieve our targets for highest sound pressure level combined with lowest possible distortion in this compact cabinet, neither a closed chamber nor a bass reflex cabinet would do. Instead the subwoofer features two passive side-mounted radiators. These can be tuned to reach further down in the frequency area than a bass port would be able to do in this size of cabinet. In this design the tuning frequency is 31.5Hz. And compared to a closed chamber the passive radiators ensure an output which is 6dB higher at 20Hz. On top of that the risk of port turbulence is eliminated.

## ACTIVE WOOFER

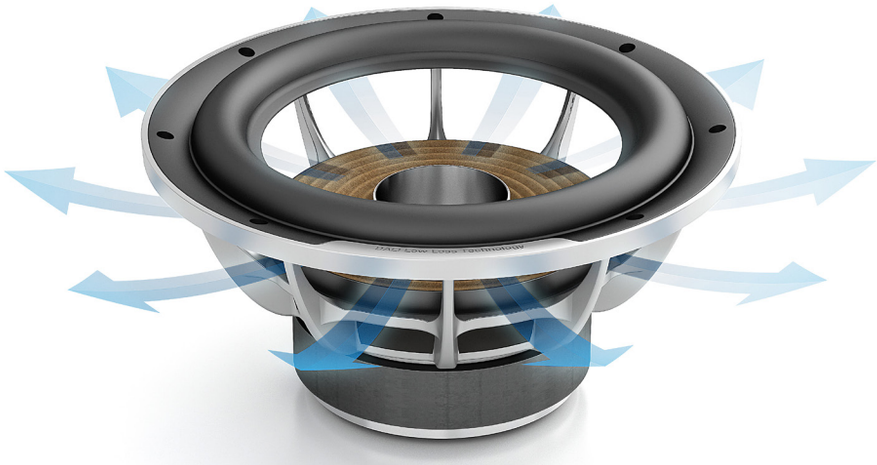
DALI SUB P-10 DSS is equipped with an active 10” down-firing woofer. The cone is a sandwich construction with carbon fibre at the front paired with paper pulp at the back. The geometry and the material applied eliminate the need for a dust cap. The result is a rigid cone with superior breakup characteristics while at the same time being very lightweight and agile. Indeed these are prerequisites for a precise bass reproduction, rendering all the dynamics of the signal.

The 4-layer voice coil is mounted on an aluminium former. In order to reduce potential micro-resonance, the inside of the former has been lined with a thin paper pulp. Voice coil diameter is a solid 63.5 mm to ensure maximum power handling. A large 2-piece ferrite magnet with a vented pole piece ensures that the voice coil is kept in a tight grip, even when the party gets going.

For optimum control of the cone excursion, the woofer features dual spiders, situated 12 mm apart. In this way the voice coil maintains a 100% piston-like behaviour, even at very high sound pressure level.

Altogether DALI's low-loss approach is implemented to the maximum. This goes for the surround as well. Made from wide, natural rubber, this part of the suspension also guarantees linearity across the entire 25 mm cone excursion. Even the oversized litz wires are made from solid silver clad 99.999% oxygen free cupper for optimum signal feed.

The chassis is made from aluminium to prevent any magnetic loss. And lots of research has gone into optimizing the entire construction for lowest possible mechanical and magnetic loss, and to ensure a free airflow.



*The chassis features 10 slim legs which is more than the typical amount. Instead these legs are sleek and optimized for a free airflow. This reduces over- and underpressure behind the spiders, resulting in the lowest possible mechanical loss and better cooling.*

## PASSIVE RADIATOR

The two side-mounted woofers share much of the technology from the active driver. Cone geometry is identical to the down-firing woofer, and the cone material is also carbon fibre. The 'upper' part of the chassis is the same – 10 legs and identical suspension. However, there is only one spider, and of course no voice coil or magnet system behind it.

None of this is due to the visual appearance, however. The whole purpose of the passive radiator is to follow the movements of the active woofer. Though it looks simpler than the active woofer the passive radiator has been through hundreds of hours of careful designing to achieve the exact same tonal balance as in the active version.

An example: Embedded in the cone of the passive radiator is just the right amount of zinc alloy to achieve the desired weight. Only with the correct weight and distribution of weight you will get the excursion characteristics you are looking for. Zinc alloy was chosen due to its density and non-magnetic properties.

# AMPLIFIER

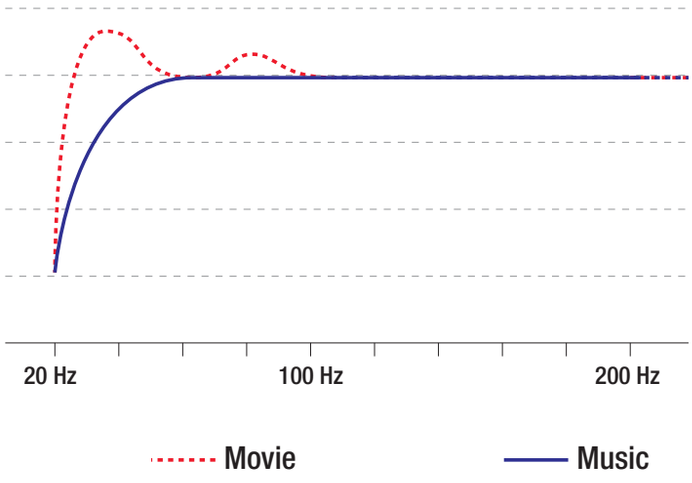
The powerful, integrated 300 Watt RMS Class D amplifier is highly linear, and will follow and render the required signal with an absolute minimum of bias. Designed not only for continuous power, but also for peak power, this subwoofer is able to deliver 500 Watt Peak Power. This is very relevant when it comes to both movie and music signals.


Switchmode power supply is part of the reason for very low power consumption and for an impressive efficiency within the amplifier. In unison the high-efficiency amplifier section and power supply construction generate an absolute minimum of heat loss. For that reason you will find no heat sink on this subwoofer.

The integrated limiter compares the input signal amplitude to the potential output signal level. If this circuit detects a potential problem the limiter will cut the signal in a soft manner and without affecting peak power.

Fitted with controls for gain, cut-off frequency, and phase, the DALI SUB P-10 DSS will adapt to any front speaker and room acoustics. And with a choice of LFE and LINE inputs it can be connected to almost any amplifier, receiver or processor.

The subwoofer also features a dedicated remote control that allows you to adjust level, crossover frequency and phase from your favourite listening position. Mute and Power On/Off can also be controlled from a distance.




*DALI SUB P-10 DSS allows you to choose between a movie and a music mode, also via the remote control. For a realistic and powerful rendering of e.g. explosions in a movie, the sound mode should be set to CINEMA, amplifying the lowest frequencies to ensure a realistic experience.*
*For a neutral and very linear performance, the sound mode should be set to HIFI. This will ensure a precise rendering of all the details of the music, while optimizing the integration with your front speakers.*

# APPLICATION

Available in High Gloss Black and High Gloss White, DALI SUB P-10 DSS is the natural companion for many speakers. DALI recommends applying the subwoofer with e.g. EPICON, HELICON, MENTOR and FAZON F5 systems.

But also customers with speakers from other brands will surely find what they need in this subwoofer. The design, technology, and construction of this subwoofer make it a perfect upgrade of any mid to high end speaker system. Whether it's a 2.1-, 5.1- or 7.2-channel system – or something in between – the DALI SUB P-10 DSS is versatile enough to take performance a great step further.

## DALI SUB P-10 DSS TECHNICAL SPECIFICATIONS

| | DALI SUB P-10 DSS |
|---|---|
| Frequency Range [+/- 3] dB [Hz] | 24 - 250 |
| Input Impedance [kohm] | 26 |
| Maximum SPL [dB] | 112 |
| Crossover Frequencies [Hz] | 40 - 120 |
| Low Frequency Driver(s) | 1 x 10" long stroke active, 2 x 10" long stroke passive |
| Enclosure Type | Closed box with dual passive radiators |
| Bass Tuning Frequency [Hz] | 31.5 |
| Connection Input(s) | RCA, Stereo (low-pass filtered) LFE (Mono) |
| Recommended Placement | Floor, near wall or corner |
| Magnetic Shielding | No |
| Max. Amplifier Power Output [RMS Watts] | 500 |
| Continous IEC Power Output [RMS Watts] | 300 |
| Max. Power Consumption [Watts] | 550 |
| Dimensions (H x W x D) [mm] | 370 x 340 x 340 |
| Dimensions (H x W x D) [inches] | 14.6 x 13.4 x 13.4 |
| Weight [kg/lb] | 19.5/43.0 |

All technical specifications are subject to change without notice.