



OePhi Reference 3.5 Loudspeaker system

White sheet, concepts, design philosophy and features

This document contains a brief walkthrough of the technical details listed in the product sheet. This serves as an explanatory resource for the concepts, design choices and the general philosophy behind the loudspeaker system. Many of these features are also present in the lower range models. The document thereby also serves as a more general introduction to OePhi's electro-acoustic design philosophy.

The fundamental concept behind the OePhi Reference 3.5 loudspeaker system, and the entire range of OePhi loudspeakers, is to create an electro-acoustic transducer that converts the electrical signal into acoustic energy with minimum loss, minimum compression, minimum modulation and with as uniform and intact time domain performance as possible. To achieve this, we have designed the loudspeakers to give the drivers the ideal acoustic and electrical conditions to operate in their respective working ranges with minimal need for electrical compensation - as this always results in losses, modulation and additional time domain distortion.

The ribbon tweeter used in the Reference 3.5 is moved forward in relation to the midrange driver and the woofers. We have done this to create perfect time domain integration with the other drivers. Our tests have shown that offsets as small as 1mm are audible. This supports our experience with the importance of the time domain in cables and electronics. The reason for moving the ribbon forward in front of the midrange is to minimize diffraction from the rest of the cabinet, which often occurs when the tweeter is placed behind the other drive units and thus radiates across the cabinet and the other drivers.

The Purifi midrange driver is placed in the narrowest possible baffle (185mm baffle to a 176mm driver). This is also to minimize cabinet diffraction. In addition, the midrange chamber is optimized through its cavity volume, damping and reflex tuning to achieve a flat midrange reproduction with minimal diaphragm movement for the fastest possible impulse handling and lowest compression. This also contributes to a higher power handling. The midrange driver uses the same geometrically stiffened paper diaphragm as the woofers but has a shorter coil and a stiffer voice coil former to improve the driver's precision higher up in frequency range. This contributes to lower moving mass, higher motor power and therefore even higher acceleration factor and higher system sensitivity. The distortion in the critical upper midrange is thereby a class-leading -70db THD, which contributes to the speaker's unparalleled resolution and transparency.

The two Purifi woofers are placed in a large bass reflex chamber with a low tuning that brings the system's self-resonance down below 30hz, which gives a typical in-room response down to about 25hz. Due to the Purifi woofers' large linear excursion and extremely low distortion, we achieve a very effortless and fast bass response. To achieve this, it has been necessary to



use an extremely low-loss filter (DCR=0.05ohm) and OePhi's internal cables (which we also use on the midrange and tweeter).

The crossover deploys bespoke technologies with a symmetrical load on the drivers and elimination of dielectric- and crossover- distortion. The goal has been to develop a crossover that does exactly nothing but what is needed and completely disappears as a contributing factor to the sound of the speaker system. For the ultimate connectivity, the Reference loudspeaker system employs WBT low mass pure silver binding posts.

The mechanical design involves the implementation of several layers of decoupling systems. The tweeter cabinet itself is decoupled from the rest of the cabinet - again to achieve low inertia and the fastest impulse processing. The main cabinet is decoupled through double decoupling in the foot system, which ensures mass-decoupling of the large enclosure for the fastest and cleanest impulse response.