

Designing the new Genelec S360

NIGEL JOPSON gets the details from Dr. Aki Mäkivirta, Genelec research and development director



At the beginning of August, Genelec launched two new high-SPL SAM monitors — the two-way S360, and the 7382 subwoofer. The S360's fusion of main monitor performance and compact size is aimed at demanding immersive applications: in combination with a subwoofer, Genelec have clearly targeted the stringent demands and certification hurdles Dolby film mixing poses.

Why did Genelec build this new monitor?

It started with demand: what type of loudspeakers do our customers need in the

future? Immersive means more loudspeakers, and if you're going to use more, the enclosures need to be relatively smaller: there may be multiple layers of loudspeakers. Nobody wants to give up SPL performance, but it is obviously very hard to fit many monitors of the size of our 1236A into a normal listening space, so we had to figure out a new solution.



Is the S360 fitted with brand new transducers?

Yes, it's a tweeter with a titanium dome: you know you're going to get high SPL with that type of design, but the big challenge is to reduce distortion to a minimum. We've been

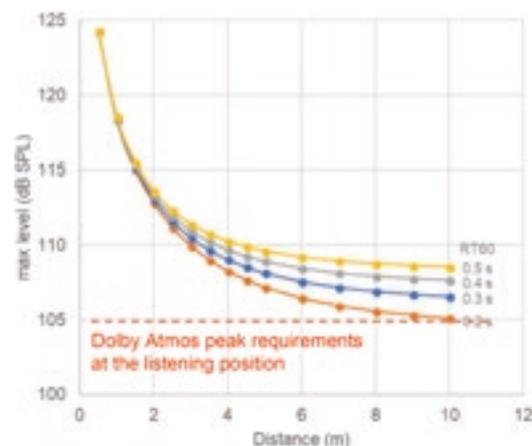
working on the design with our manufacturing partner for a couple of years now. The tweeter is coupled with an integrated elliptical DCW (Directivity Control Waveguide), CNC-machined into the MDF cabinet.

Did you give yourselves a target-size of enclosure?

We debated this for some time, and ended up with 360x360, and the front baffle is 36mm...

And the price is €3,360 — there's some sort of message in those numbers!

We also started from the premise that both enclosures would be SAM products, because you cannot guarantee a perfect location for your loudspeaker in the same way you would have been able to with soffit-mounted stereo.



What does 'high SPL' mean?

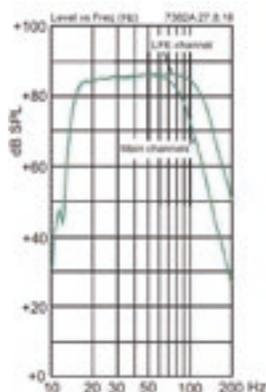
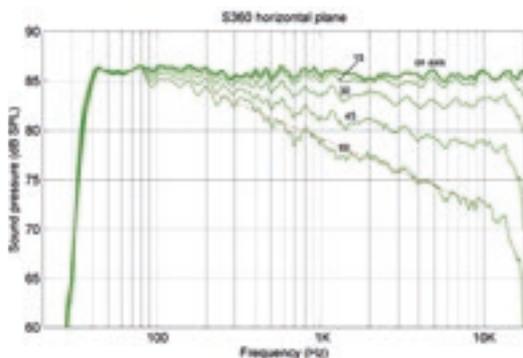
For a pair, we can reach almost 130dB at one metre. The short-term RMS max SPL average, measured with sinusoidal bursts within 100Hz to 3kHz, is greater than 118dB at 1 metre. The continuous RMS max SPL (limited typically by the protection system) with IEC noise input is 112dB at 1 metre. Both measurements are in the free field (anechoic room).

At which frequency is the crossover to the sub?

For a SAM subwoofer, you can choose any point between 50-100Hz, according to acoustic constraints. It is possible to use the S360 as a stand-alone loudspeaker, for reproduction down to 36Hz. The S360 has dual down-firing LIP slot bass reflex ports, the base of the cabinet is raised a little by our Iso-Plate design, which means the cabinets can actually be put in soffits if you want a flush-mounted system.

What about access to the S360 amplifier in a soffit-mount?

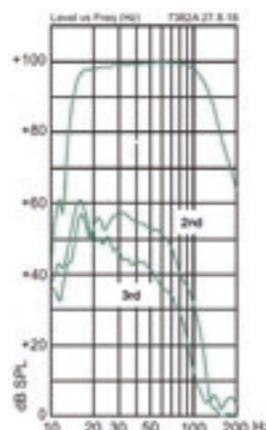
The amplifier can be removed if necessary, and remote-mounted with an optional 2U rack kit we provide. The amplifier uses convection cooling, we don't have forced-air, so a little space above and below should be provided.



How will the cabinet be mounted for cinema applications?

We have four mounting positions on the loudspeaker, top and bottom, and we have brackets available for both orientations. The S360 can be mounted on the wall or from a truss if desired. If you assume an RT60 of up to 0.5s, you should be able to reach 105dB, even at a 10m distance. So this system becomes a tool you could really use in medium-size dubbing stages. In this environment, off-axis performance is important, and if you look at the frequency response plots you can see we have a nicely systematic roll-off, even at 60° off-axis. We won't end up with a coloured reverberation field in the room.

/ 7382A subwoofer



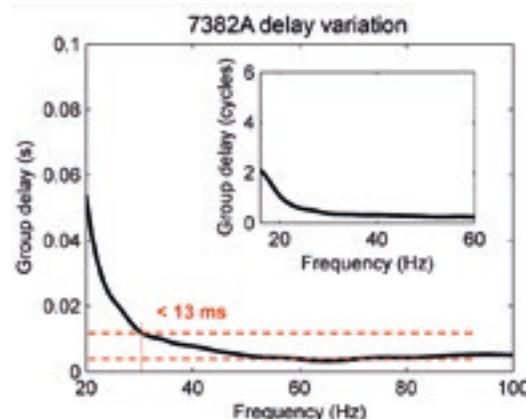
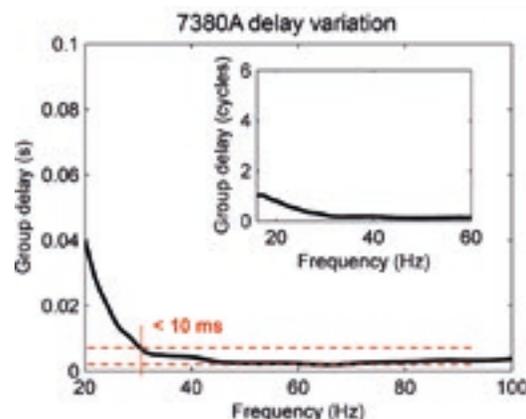
/ Harmonic distortions in free field. In half space the output will be 6dB higher (106dB SPL).

How steep is the crossover to the tweeter?

It's around 48dB per octave — we have a rapid crossover to minimise audio colouration effects. Below 200Hz the radiation is fairly omnidirectional, above around 500Hz the directivity is pretty constant. In the time domain, the system is DSP-equalised down to relatively low frequencies. It's very useful to be in sync in the time domain, you're basically turning the electrical signal into pressure variation in an efficient manner. Our goal is always to reproduce the signal input to the monitor.

Which transducer is in the sub?

The European-made driver is the same as we use in our 7380. The 7380 goes to 16Hz in an anechoic room, the 7382A goes to 15Hz. If you place it by a wall in a normal room, you would certainly expect a bit more than that. There's a single port running along the side at the rear, and the amplifier tuned to work with this particular box. If you add the Genelec 9301A AES/EBU Multichannel Interface to this system, the digital input can be expanded to 7.1. With these subs, we have less than 13ms of additional delay (Group delay) at 30Hz. We are within one cycle almost down to 20Hz.



Who do you see as being your customers for this system?

I hope it will be the cinema and film industry professionals, and people who are building physically larger immersive monitoring spaces. The main goal of this project has been immersive applications for medium to large sized rooms. 📍