

Arc Audio SW12D2 — a premium flat woofer



12 centimeters

► Arc Audio has set to work on flat woofers. However, following their unique policy, they dealt with this subject in an independent and thorough way. The result of this work has landed in our editorial office: the SW12.

Flat subwoofers really are a thing nowadays. Woofers for a hidden installation, made so that bass fits into the car without consuming a lot of space. The key topic here is the installation depth. Because the flat bass enclosures are easier for hidden installation than the thick ones, e.g. in the spare wheel trough. One option is to use several small subwoofer chassis, which, of course, also have less installation depth than a full-sized woofer. Alternatively you can construct the woofer in such a way that it becomes

flat. The challenge is always the motor, which needs a certain size (and above all depth) to deliver adequate performance. While other manufacturers tend to fit the magnet system into the basket as much as possible, Arc Audio goes a different way. The new SW12 has a front motor. This is a viable way, because

it does not matter whether the cone is pushed from behind or pulled from the front — it is moving back and forth anyway. This idea is not new, because there were and still are a number of speakers with the same

The basket is closed by a lid at the bottom, it can be installed directly on the rear panel to save space





The extremely shaped cellulose membrane creates room for the front motor

concept. However, these are usually much smaller bass-midrange speakers, while Arc Audio is presenting a full-grown twelve-inch piece. The Achilles' heel of the front motor is usually that the motor is based only on a magnetic scatter field, which comes from two magnets set up repelling each other. So for the SW12 to become strong enough, they had to come up with some kind of solution. The SW12 has a motor, which is constructed like a tweeter. From the outside we can see a solid steel cap, which encloses the motor like a pot and which, in addition to mechanical protection, also represents the outer magnetic pole. Inside, a lot of expensive top quality neodymium is working to provide enough magnetic field for a powerful drive. Also, a subwoofer needs a massive linear stroke to move a lot of air at low frequencies, so the SW12 has an XXL voice coil with large winding height. Available as a 2 x 2 or 2 x 4 Ohm dual coil, it is made of copper-plated aluminum wire to reduce the weight and has a handsome diameter of 3 inches and a 15.5 mm linear stroke. The cone is made of paper or treated cellulose fibre, which can be pressed into any necessary shape. Arc Audio makes the best use of it and gives the membrane a steeply arched shape to make room for the motor. In addition, there is a kink on the membrane edge that stabilizes the shape. The spider sits normally under the membrane, it has to work through about 25 millimetres to the base plate before it makes a "tock". The whole unit is packed in an appetizing die-cast basket and makes a very sophisticated impression.



Front driven: the best neodymium quality is hiding under the solid iron pot



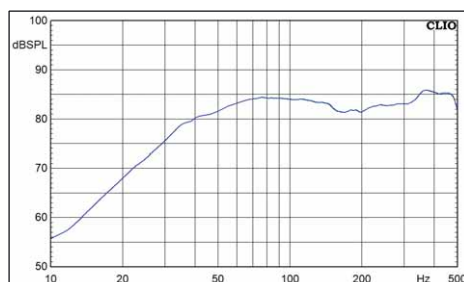
Measurements and sound

First, we measure the SW12 with a yardstick. The mounting depth is only 63 mm, making the SW12 one of the slimmest 12". In addition, you can mount the woofer with the basket on the back wall, as there is no ventilation or heat dissipation. The front of the woofer, including the drive, measures only 57 millimeters, so the whole thing needs only a depth of 12 centimeters to deliver perfect work. Of course, you do not pack such a woofer into a large bass reflex housing, but rather into a compact closed one. The Arc Audio can work in a range between 20 to 40 litres, whereby we have found the golden mean: Arc Audio recommends 24 litres as optimum, which, of course, works perfectly. In front of the measuring microphone, the Arc delivers a perfect frequency response. It's built-in resonance of 45 Hz is sufficiently low and the relatively small in-box Q of 0.63 ensures a very flat drop to low frequencies. Just the nominal sound pressure at 84 dB at one watt becomes quite modest. In the matters of sound, the SW12 proves that a good enclosed subwoofer with a bit cone area does not have to hide from anything and anybody. It delivers enough pressure and captivates with its dreamlike impulse reproduction. The SW12 is so high-class that we are more than impressed by how much volume it produces and how dashing it reproduces bass drums. There is always sufficient profundity, while the woofer plays on with high precision down to the deepest notes.

Conclusion

Admittedly not very cheap, the Arc Audio SW12 delivers high-quality craftsmanship as well as an impressive acoustic performance. The whole thing has minimal space requirements, so you can safely take your hat off to it.

Elmar Michels



Almost perfect frequency response. The closed box runs out very flat to low frequencies

All this is only 12 cm deep, and that at 63 mm installation depth



ArcAudio SW12-D4

Distributor	Fortissimo, Friedrichshafen	
Hotline	07544 7414750	
Internet	arcaudio.eu	

Sound	50 %	1,0	■■■■■
Low frequency extension	12,5 %	1,0	■■■■■
Sound pressure	12,5 %	1,0	■■■■■
Sound purity	12,5 %	1,0	■■■■■
Dynamics	12,5 %	1,0	■■■■■
Lab	30 %	1,8	■■■■■
Frequency response	10 %	1,0	■■■■■
Efficiency	10 %	3,0	■■■■■
Max. SPL	10 %	1,5	■■■■■
Build quality	20 %	1,0	■■■■■

Specifications

Basket diameter	31,0 cm
Mounting diameter	27,6 cm
Mounting depth	6,3 cm
Magnet diameter	10,3 cm
Weight	5,3 kg
Nominal impedance	2 x 4 Ohm
DC resistance Rdc	1,66 Ohm
Coil inductivity Le	0,71 mH
Coil diameter	76 mm
Membrane surface	543 cm ²
Resonance frequency fs	32 Hz
Mechanical Q-Factor Qms	3,49
Electrical Q-factor Qes	0,59
Overall Q-factor Qts	0,50
Equivalent volume Vas	38,9 l
Moved mass Mms	254 g
Rms	14,88 kg/s
Cms	0,09 mm/N
B x l	12,09 Tm
SPL 1 W, 1 m	84 dB
Recommended power	200 – 600 W
Test cabinet	g 30 l
Reflex tunnel (d x l)	-

Rating

Price	500 Euro		
Sound	50 %	1,0	■■■■■
Lab	30 %	1,8	■■■■■
Build quality	20 %	1,0	■■■■■

ArcAudio SW12-D4

Absolute Top Class
Top Class
 Upper Class
 Middle Class
 Entry Class

1,2
 Price-Performance:
 very good

CAR & HiFi
 Issue 2/2020

"A superbly made flat woofer"