



## the best compact loudspeaker we have built

**SA2K master is a breakthrough for compact loudspeakers. It breaks with the traditions and sets new standards for sound quality. You cannot compare it with other compact loudspeakers because they have nothing in common, apart from the size.**

SA2K master are for people with a burning interest in music, and who want to hear every detail and nuance in the music and at the same time want a compact loudspeaker.





A new product from SA does not start with a market survey where we ask potential buyers for advice or directions to create the product. We regard that as our own responsibility. SA loudspeakers are based on an idea and we ask ourselves all the time: "What if ...?". Analyses and statistics make products the same because they only provide the products with the features the consumers already know. And the consumers only know the features they have seen before. This is one of the reasons why most products in the audio industry look the same. Only originality set new standards. That was the idea with SA2K master, when we asked "What if ...?" in 1994. Nobody could have known that it would take 6½ years before there was an answer to the question. Today we are proud of the result. "What if we developed a compact loudspeaker that could remove the well-known limits? What if we could get deep bass, high power handling, low distortion, speed and precision from a small cabinet?". "What if we could provoke the people who believe that you have to have big loudspeakers to get big sound?". These were the simple questions we asked ourselves. This was the task. There was no actual deadline, because at that time when we got the idea for the SA2K master, there was no technology that could support us. SA2K master is the first product of its kind.

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**SA wanted to design a speaker:**

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- that sets new standards for musicality, precision, dynamics , bass reproduction, power handling and uniform sound quality in compact speakers used heavily over prolonged periods
- that integrates effortlessly with the acoustics in the room and the rest of the equipment chosen
- that is dependable, durable and will live up to its technical specifications for many years.



# the technical background

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**a completely new way to build a loudspeaker cabinet**

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SA2K master is the first loudspeaker in the world that has been built according to a new patented principle. Here the sides of the cabinets can be made curved, which increases the mechanical stability. The two sides, the rear and the front have been made from one piece of wood.



seen from above, you see the special shape of the cabinet

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**better sound starts with a better cabinet**

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SA2K master is the first loudspeaker in the world that applies a new and patented principle of assembling and designing loudspeaker cabinets. The technology is called Hornflex.

- The curved shape of the cabinet is stronger and more vibration damping than a traditional cabinet
- The curved shape is contributing to a more controlled radiation of the sound

The Hornflex technology is based on an MDF plate that is integrated with a composite material. The MDF plated is slit and the slots are filled with a plastic-containing vibration damping glue that hardens for 24 hours while the shape of the cabinet is spanned into position.

- The composition of various materials and vibration damping glue makes the cabinet considerably stronger and more resonance-free than any other technology based on wood. The woofer, W2K, is bolted on to the front plate of the cabinet
- The cut out for the woofer has a big bevelling inside the cabinet in order to avoid compression of the air that is moved by the speaker membrane
- The geometry of the cabinet (width, height and placement of the loudspeaker units) on the front plate is adapted to the frequency response of the drive units. Furthermore, the tweeter is placed asymmetrically in order to minimise diffraction (the cabinets are delivered mirrored)
- The opening for the bass reflex tube is placed at the rear of the cabinet to avoid that the big amount of air that is moved in the bass reflex tube, disturbs the sound radiation from the drive units. This means that SA2K master is to be placed at least 7 centimetres from a back wall
- The front grille serves to protect the drive units. SA2K master sounds best without the front grille



the rear is only 10.5 cm wide

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**what does the cabinet mean to the sound?**

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The cabinet is the foundation of the loudspeaker. A stronger and more vibration-free cabinet gives the drive units better working conditions and thus a purer and more natural sound.

only 34.5 cm tall

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## maybe the world's finest 13-cm woofer

W2K is the specially developed woofer that enables SA2K master to deliver the unique sound quality from a cabinet volume of only 8 litres. It has an extremely powerful magnet motor and the membrane has a travel of 22mm. This makes W2K able to move 5-6 times as much air, as a conventional woofer of the same size. The membrane has ten through-going slits with damping material that works like “traps” for undesired vibrations. The membrane is made from wood fibres.



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## W2K - a small woofer with an astonishing big sound

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The woofer W2K has been developed in cooperation between Tymphany A/S and System Audio A/S. The objective was to create a woofer, which could be part of a compact cabinet and give increased dynamics, less distortion, higher power handling and a deeper bass than any other woofer of similar size

- The design of W2K has nothing in common with a conventional woofer apart from the fact that it has been build based on the dynamic principle (magnet, voice coil and membrane)
- W2K reduces distortion and modulation 10 times compared to a traditional woofer and can stand almost twice the load
- Total development time: 6½ years



W2K. The unusual colour of the membrane is due to the five types of wood fibres.

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## the magnet for a W2K (patented)

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### a huge motor

- The diameter of the magnet is 110mm. The most normal is 72mm
- Three copper rings (patented principle) keep the inductance of the voice coil homogeneous, no matter if the membrane moves in or out
- Ventilation through the middle of the magnet (the pole piece)

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## what does this magnet mean to the sound?

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The magnet is the “motor” of the loudspeaker and its strength determines its ability to control the movements of the membrane. Its size also serves as efficient cooling. The copper rings (Symmetric Drive) give the loudspeaker less dynamic distortion and the ventilation in the pole piece prevents the air from being compressed behind the dust cap of the membrane

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## suspension for W2K

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### suspension that does not slow down the membrane

- Shaped so that the material is not stretched, but “bends” around a large number of points



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**what does this suspension mean to the sound?**

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The suspension keep the voice coil in position in the gap of the magnet. The suspension in W2K is not wavy. Therefore it is not stretched and does not slow down the membrane when increasing the volume. Neither does it change the bass reproduction of the loudspeaker when changing the volume. It means that the sound character is more homogeneous no matter how loud you play – and the sound becomes more dynamic



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**the membrane for W2K**

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made of five kinds of wood fibre

- Wood fibre membrane consisting of five kinds of wood fibre and a binder
- Ten through-going slots filled with two different kinds of vibration damping glue
- Dust cap with two through-going slots filled with a third type of vibration damping glue
- Very strong and stiff membrane

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**what does this membrane mean to the sound?**

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This kind of loudspeaker membrane is quite new. The strong and lightweight wood fibre material makes the sound precise. The special slots in the membranes work as "resonance traps", where vibrations get "caught". The materials have been selected based on comprehensive listening and measuring tests

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**the voice coil for W2K**

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## deep bass and high power handling are made possible

- The height of the voice coil is 18mm (Diameter: 38mm)
- It makes the membrane able to move 22mm!
- The coil is wound on an aluminium former



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**what does this voice coil mean to the sound?**

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Membrane movements up to 22mm have not been seen before on a small woofer before. This makes W2K able to reproduce deep bass that is incredibly precise. The aluminium former serves as efficient cooling of the coil, but also works self-centering on the coil when it travels through the magnet at loud volumes. Both give a higher power handling than normal.



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**rubber suspension for W2K**

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does not remove energy

- Larger than a normal suspension
- Material with low mechanical loss

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**what does this edge suspension mean to the sound?**

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The unusually big suspension allows the woofer to perform big membrane movements. It is made of a material that does not "absorb" the sound. Therefore it does not hold back sonic details.

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**chassis for W2K**

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## cast and aerodynamic

- Made of cast aluminium, which is non-magnetic
- Aerodynamic shape
- Mechanical grounding through five points at the screw holes

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**what does this chassis mean to the sound?**

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The chassis solidly keeps the woofer parts together because it has been cast in aluminium. The material is non-magnetic so that the forces of the magnet are not led to the wrong place. The aerodynamic shape allows the air to freely flow into the cabinet without compression.





hver eneste diskanthøjttaler håndbygges, fintrimmes og kontrolmåles, for at opnå fine lyd detaljer



# world class tweeter

The tweeter is a handcrafted piece of fine mechanics with incredible sound precision and durability. The fine details of the music are conjured up through five treatments of the membranes. Tiny blocks of felt that damp the tweeter's own small cabinet and a special design of the geometry of the membrane.

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## TK - one of the world's best tweeters

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A precision mechanical masterpiece. The tweeter TK, developed for SA2K master by Tymphany A/S, reproduces the details of the music with an incredible purity. If you want to get acquainted with the function of a tweeter, then listen: An uncoloured reproduction of the highest tones the human beings can hear requires that you can control the mechanical movements of membranes down to 0.0005mm!!!

The work with the development of TK has been about creating a tweeter that does not hold back the small and important sonic details. At the same time it has been quite central that the sound qualities of the tweeter and the musicality should be united with the sound from the woofer, W2K.

- TK is handcrafted by Tymphany A/S
- It can stand at least twice as much power as a conventional tweeter
- It has far less compression than any other tweeter

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## magnet for TK

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unusually big magnet for a tweeter

- Patented magnet system with copper caps giving a homogeneous magnetic field
- Shape of pole piece designed so that air flows efficiently into the chamber behind the membrane
- Star-shaped milling in the front plate of the magnet works as chamber for the membrane suspension



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## what does this magnet mean to the sound?

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The magnet is the "motor" of the loudspeaker. The sophisticated construction, that both leads the magnetism efficiently to the voice coil and at the same time ensures that the air can flow freely and uncompressed, gives possibilities of new world class sound





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rear chamber for TK

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## the tweeter cabinet inside the cabinet

- The tweeter has its own cabinet behind the small dome-shaped membrane
- "Floating" felt block under the membrane
- "Spears" guide the air from the rear of the membrane down into the chamber
- The chamber is dampened with 100% pure cotton

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what does the rear chamber mean to the sound?

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It is pure luxury for a tweeter to have its own cabinet. The small felt blocks, the special size of the chamber, the special shape where the air is "guided" down into the chamber tells that special efforts are made in order that the microscopic movements of the membranes are not disturbed.

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membrane for TK

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## this is where the sound details come from

- Incredibly lightweight membrane
- Produced from woven textile fibres
- Coated five times with a very thin damping glue

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what does the membrane mean to the sound?

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The extremely lightness of the membranes makes it possible to reproduce the highest tones of the sound. SA thinks that the woven textile fibres give by far the best sound quality. The five coatings, which the membrane gets, and their importance to the sound have been decided based on extensive measuring and listening tests





# Crossover network for SA2K master

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**incredibly simple and quite sophisticated**

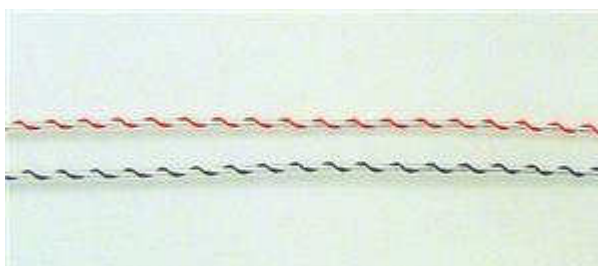
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The crossover network for SA2K master would have consisted of about 30 components, if it were constructed like a traditional circuit. However, by means of a computer based optimising program the circuit has been simplified to consist of 6 top class components. The circuit forms a 4<sup>th</sup> order Linkwitz/Riley filter, with impedance optimising and phase correction. Such a sophisticated crossover network, with so many functions, is possible as most components in the traditional big crossover networks are not especially efficient. Many components do the same, so to say, or interfere with each other in the worst cases.

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## SA2K master uses the best cable in the world

The internal wiring in the SA2K master consists of Nordost monofilament cables. The SA2K master contains a total of 1.8 metres of cable. The internal wiring is just as crucial to the sound as the external cables. All SA speakers are developed with particular cables in mind but using the world's best cables makes the sound quality even better



**is the difference audible if you don't use Nordost monofilament cables elsewhere in your sound system?**

Yes – extremely audible. The SA2K master is quite simply a better speaker. It would still be a better speaker even if you used a different type of cable in the rest of your system.

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## checking whether your speaker is a master version

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A small label on the back of SA2K master reads "master version – internally wired with Nordost monofilament cable".

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# technical specifications

speaker dimensions (WxHxD) cm	19.5x34.5x30
power handling	200 Watt
frequency range	40-30.000 Hz (+/- 1.5 dB)
impedance	4-8 Ohm (easy load)

### more specifications

Finish:  
**real wood veneer:**



maple



enamel paint available on special order.



# technical description

- Cabinet built according to patented principle
- Drive units with new technology
- 2-way design
- Optional bi-wiring/bi-amping
- Accessories: FS2 K loudspeaker stands