

Perfect two-piece ensemble

Finite Elemente, renowned as a manufacturer of high-quality racks and component supports, have launched their first loudspeaker. Aren't there enough loudspeakers? Well yes, but the "Modul LS" couldn't have been built by anyone else.

by Matthias Böde

Clever ideas often result in huge benefits. Take Gore-Tex, for example, used in waterproof clothing and as an efficient non-conductor in hi-fi cables, and nanoparticles protect us in suntan lotions, work as dirt-repelling auto paints, and who knows what else. And Finite Elemente used this principle of technology transfer in developing their first loudspeaker, the unusually designed Modul LS.

Although this manufacturer, based in Brilon in Germany's Sauerland region, has achieved an international reputation until now with resonance-optimised and exquisitely designed racks and component interface systems for all types of hi-fi applications, it is precisely their special features that have been integrated into the Modul LS, giving it a special niche in the market.

The loudspeaker comprises two modules – the separate cabinets for woofer and midrange/tweeter as well as a base. However, this is not the only reason for the loudspeaker's simple name. As Finite Elemente use the "Modul" name for their exquisite furniture and sound system (see box), and the Modul LS slots perfectly into this concept.

Finite Elemente know only too well that a such hotchpotch of different styles would not be popular with their demanding clientele and therefore decided in favour of visual uniformity in all components. And sceptical people like us can quickly arrive at the conclusion that design constraints are being forced onto a loudspeaker and that, as a consequence, here the loudspeaker function is subordinate to the form.

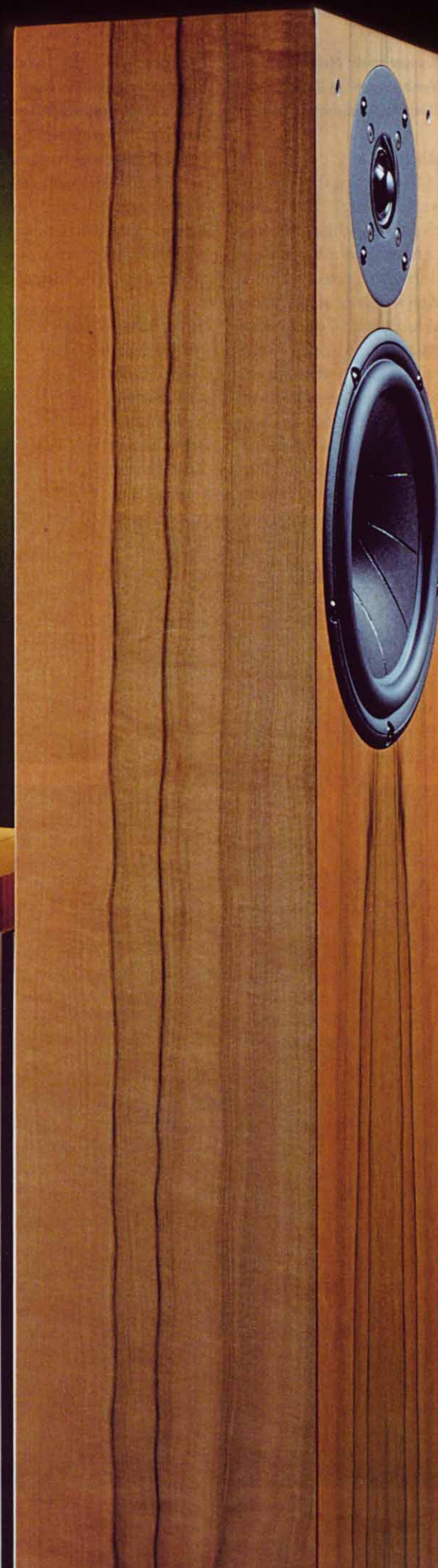
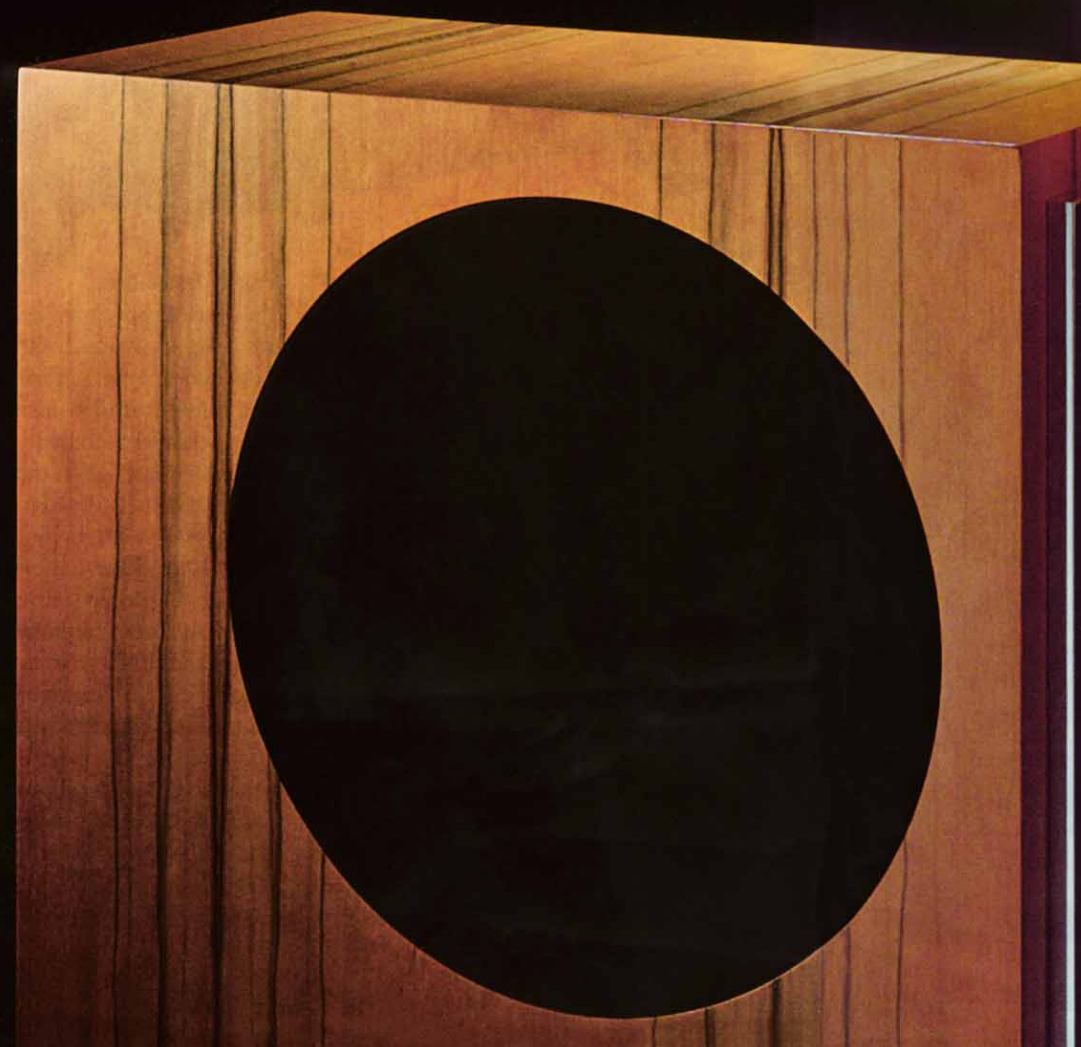
SUBSONIC
SUBSONIC = EIN

LAUTSTAERKE
RECHTS + 1 <--
LINKS + 1

PHASE
RECHTS 0 <--
LINKS 0

RAUMHAERTE
RECHTS 2 <--
LINKS 2

Also included is a cable remote control which can be used, for example, to switch a subsonic filter or to adapt the subwoofer level to the room acoustics.



But we very quickly had to dispel such reservations. The Modul LS is by no means a sound accessory for stylish living-room environments – although it can certainly fit that bill –, but is a fully developed high-end concept that stands out with a series of logical detailed solutions and a complexity that you don't come across all that often. And Finite Elemente are, when you stop to think about it, even predestined to design a loudspeaker like this. Because a loudspeaker sets similar standards to a rack. The main aspects here are strength, immunity to resonance and exact dissipation of the energy generated by the driver units.

This is not inconsiderable in some cases. When the two 26 cm metal cone woofers set into the sides of the slim woofer section really get going, then you wouldn't want to rely on just the 30 millimetre multiplex panels to keep them under control. The share of the power from the up to 1000 watt powerful integrated amplifier that is converted not to sound energy, but to kinetic energy is led off via the solid base into special interface feet including a ceramic ball bearing (see box) that dissipate this off in a controlled

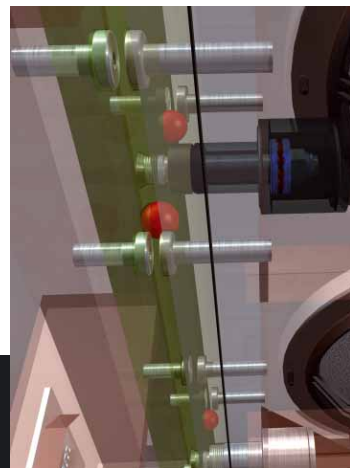


Three centimetre thick multiplex panels and frame-type struts form the cabinet of the woofers

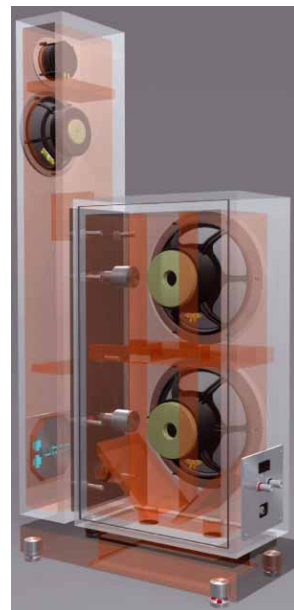
fashion, thus ensuring a fast, taut and clean reproduction without any "clogging effects". These couplings have just about as much in common with standard spikes as an old VW Beetle has with a new Porsche 911.

Yes, you heard correctly, the Modul LS is a semi-active loudspeaker, meaning that a connected amplifier only has to handle the midrange/tweeter section, while the Class-D amp integrated into the back of the bass cabinet provides the power for the two woofers that

are used below around 160 Hz. In practice only the red lamp on the baffle and the mains connection next to the polarity clamps indicate the installed crossover electronics and power amplifier stage. As a reliable automatic signal-controlled switching on-and-off dispenses with the need for any manual intervention. So it's logical that this offers completely other possibilities than a passive model.



The transparent diagram reveals the assembly. At the bottom you can see the design of the supporting structure together with the bolts and ceramic ball interfaces



The lower ranges are equalized using the "Pole-Shift-Filter Technology" by the distinguished developer Siegfried Linkwitz. This is designed to allow deep bass from small cabinets by increasing the amplitude values, i.e. the level, as the frequency decreases. To do this the drive parameters in installed state are used as the basis, whereby every operating state can be converted to the filter characteristic. In this way the Modul LS gets down to 20 Hz not just linear- and lower

Stable and defined

The Modul LS cabinet follows the same principles as racks and component feet

Coupling and resonance dissipation have always been topics that kept Finite Elemente occupied. Whether the task was to take up oscillation energy as effectively as possible or then to lead this off – Finite Elemente have a vast amount of experience in this field. And the knowledge gained in developing their top-class hi-fi racks and component interfaces was used in the development of the Modul LS loudspeaker.

For example the resonance frequency of the cabinet is pushed outside of the trans-

mission range in which the driver works, and the loudspeaker is not on normal spikes, but has a coupling system based on Finite Elemente's proven "Cerabase". This comprises two metal components that are connected to each other only via three ceramic balls, and this is designed to cause defined resonance transfer and a solid standing. The upper section is installed in the heavy speaker base where both its weight and that of the cabinet apply considerable contact pressure to the "ball bearings". The lower section tapers to a point. Anyone who has tried various interfaces under their loudspeakers knows just how decisive the influence can have on the sound impression.

This patented concept has been perfected for the connection of the bass to the midrange/tweeter unit. Under no circumstances may these move against one another, as this would result in loss of detail, and they must be firmly interlocked with each other. On the other hand an internal contact is also an ideal bridge for excitement

from the corresponding adjacent cabinet, and this has to be prevented as well.

The solution to these conflicting goals is a no-compromise two-layer metal interface made of two ten millimetre thick layers of aluminum that creates an ultra-stable connection between the two sections. Two sturdy bolts anchored in the woofer cabinet press the plates together with a massive tension force of 40 Nm, thus guaranteeing the immobility of the construction.

But the two plates are not simply attached to each other. Here ceramic balls again ensure a clean connection. And the smaller screws used to fix the otherwise free-floating midrange cabinet to the connecting piece do not form any direct bridge to the woofer unit. Energy transfer is exclusively via the defined ceramic ball contact. Admittedly this is extremely complex, but Finite Elemente know just how important questions of energy dissipation are.

Finite Elemente's "Cerabase" feet, available separately and in sets, are used instead of simple spikes to create the contact to the base. Three ceramic balls form the points of transfer between the sections



What an effort! The interface used to connect the two cabinets is 61 centimetres in length and weighs six kilos

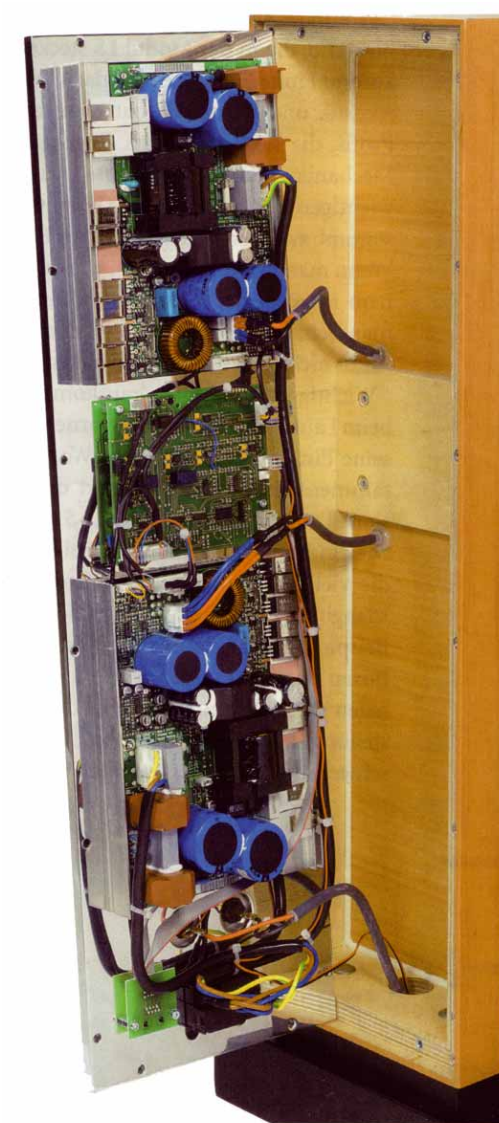


WBT polarity clamps for the external amplifier, mains connections to supply the integrated bass amp and socket for the remote control (r.)

as long as the switchable subsonic filter doesn't prevent this –, but can also generate up to 110 db maximum volume. Respect! Like the woofers the 18 centimetre diameter midrange and the 25 millimetre cone are from the Danish specialist manufacturer Scan-Speak. Their slim housing of lightweight composite board with punctiform reinforcing struts – Finite Elemente are masters in this material mix based on their experience in rack design – stands upright in front of the woofer sections and is closely connected with this. The two-layer aluminum interface (see box) creates a solid unit with defined resonance transfer using a total of four coupling ceramic balls each 17 millimetres in diameter. With regard to positioning the Modul LS behaves just like any other high-quality loudspeaker. Perhaps it is even a touch more sensitive. Due to the precision achieved here even the smallest changes are immediately audible, which makes positioning actually easier than more difficult.

And Finite Elemente even helps the new owner with the included remote control to adapt the woofer settings to match room conditions. In addition to parameters such as "Room Size" and "Room Hardness", the latter to match either austere or cosy type of furnishings, that generate sublime variations in bass reproduction, the lower ranges can be either reduced or increased through eight stages in either direction. Very practical! This is also true for the subsonic filter that protects the woofers from infrasound from the turntable, for example.

You should immediately ignore the possibility of reversing the phase, as this causes a strange sound image and the measuring engineering reveals a deep crater in the transfer range, whereas the frequency response has an almost perfectly smooth course at normal phase (see diagram). Furthermore attention should be paid that the woofers of both loudspeakers are directed outwards. Directing them inwards resulted in a reproduction which was both uneasy and squeezed, at least in our listening room. Finite Elemente also recommend as a rule that the woofers face outwards!



The active crossover to separate off the higher ranges and the efficient Class D power amplifiers are installed screened from the woofers in a separate chamber

Wilson ben... Extrem aufwändiger Standlautsprecher mit Kohlefasertechnologie und Isobaric-System. Ungemein klare, stimmige und musikalische Wiedergabe über das gesamte Spektrum. Eine Traumbox!	ebenso feiner wie ein... Elac FS 609 X-PI 12/05 12000 ★★★ 90%	Air Motion Transformer... Progressive Audio Pearl 2/02 Sehr komplett, wunderbar durch vorragender Stimmwiedergabe
Dynaudio Evid. Tempt. 9/01 ab 31000 ★★★ 95%	JBL K2 S5800 6/04 20000 ★★★ 90%	Piuga C3 LTD 5/04 Superb auflösender und abbildender, der auch im Bass ordentlich mittelgroße Räume
Die erfreulich raum- und elektronikunkritische Säule spielt so exakt auf den Punkt wie kaum ein zweiter Wandler. Tonal perfekt ausbalanciert, in der Raumabbildung extrem variabel	Finite Elemente Mod. LS 8/08 18000★★★★ 95%	Revel Performa F32 5/04 5800 ★ Extrem tief hinreichender Bass, trotz sehr sehr pegelfest, vorbildlich schlüssig
Unter idealen Bedingungen setzt die vierteilige Schieferbox Maßstäbe beim Auflösungsvermögen, aber erst unter Wohnraumbedingungen offenbart sie ihr aberwitziges Temperament	Sonus Faber Amati Hom.6/02 17000 ★★★ 89%	T+A TCI2E 1/05 7700 ★ Der Elektrostat für die Höhen zaubert ein springendes Klangbild, kräftig zupackender
JM Lab Nova Utopia 6/03 30000 ★★★ 95%	Tannoy TD12	Audio Physic Virgo 10/07 6000 ★★★ Ein Wunder an Durchsichtigkeit, Plastizität – schnell, knackig und wie a
Die neue Utopia hat den derzeit wohl besten Hochtöner am Markt verbindet in nie		Lua Con Espresso

Profound technical understanding and concentrated know-how are behind the Modul LS. And how did Finite Elemente arrive at this result? Well, the acoustics and electronics were bought in, along with the professionals mastering this engineering. The mechanics including the cabinets and the all-important tuning of the overall system are by Finite Elemente. No problem. Once you know just how much of a Mercedes is bought in from third parties, you have to ask yourself why the suppliers don't just build the rest of the car as well. What is really important in loudspeaker design is how well the individual components interact with each other to ensure perfect results coming out at the front. And this is where the professionally tailored Modul LS works like a truly homogeneous single unit. Here the much acclaimed internal order of the sound images has been exaggerated. For example in choral recordings: even with top-of-the-range speakers you generally get slight tonal smudging effects that can give the representation an almost transcendental floating aura. In conjunction with the Modul LS these are hardly

discernible – with extremely positive results for both transparency and speech intelligibility. Initially this might seem rather sober, but this loudspeaker has no time for any fancy mumbo-jumbo. And there are two other aspects in this regard that make Finite Elemente stand out from the rest. On the one hand there is their earthy, robust playing that in spite of all the necessary clarity still remains even when you turn up the volume with the Cure's "Out Of This World" with its complex sound overlays, and that never seems to be in the foreground, frayed or even analytical. The treble range has an almost silky diction, clashes of cymbals have a sparkling resonance, and there is no sign of any tendency to the ethereal. Instead what is demonstrated is body and a certain ponderousness of the original that is unfortunately so difficult to

way. No, we know these drivers from other loudspeakers where their performance is not as smooth or rounded.

I've pondered this for some time and I'm now convinced that this in direct relation to the advantages of the Modul LS at the opposite frequency extreme. As this loudspeaker is not just dry – it's extra dry! Its foundation is with almost iron strength. It reveals such a vast amount of details and intermediate tones that some others swallow up, or at least present with less precision. And here you might initially miss a little bit of comforting roundness, the silky compromise. But after a brief period you will never want to do without this agile, gruff representation. It is this quickness, the lightning-fast acceleration down to the very lowest frequencies that supports even the hi-hats mentioned above. If a loudspeaker cannot manage a unified tempo across the full transmission range, then the faster trebles generally break loose from the tonal unity. This results in a typical hi-fi reproduction with trebles that are admittedly finer and brilliantly sparkling, but that dominate everything else artificially. True, this can sound wonderful, but Finite Elemente show just how it should be. And a glance at the excellent step response underscores at least the proposition of top timing. What the

TEST-CHAIN

SACD PLAYER: Esoteric X-05, Lindemann 820S

TURNTABLE: Acoustic Solid One, Linn LP12 SE

INTEGRATED AMP: Boulder 685, Symph. Line RG14

PRE AMP / POWER AMP: Audio Research Ref.3/Soulution 710

SPEAKERS: T+A TC12A, Wilson Audio Maxx2

SPEAKER CABLE: MIT Magnum MA, Mudra Silvercom

achieve with hi-fi. The Modul LS manages to achieve this, and this although its drivers are admittedly high-quality, but not by any means exotic, specially built solutions with alleged qualities that could not be achieved in any other

detailed solutions. It is obvious that knowledgeable hi-fi experts have been involved in the development.

For example, the separate elements are available in four different sizes as well as open, with a flap or drawer. Matching inserts for CDs, DVDs or even LPs are no problem. The "Integrated Cable Management" will also

These are concealed discreetly behind fine material front covers, as shown in the left-hand picture. Admittedly you cannot expect the same audiophile standards from the Modul range available in a variety of wood veneer and lacquer finishes as you would from Finite Elemente racks. However great emphasis was also placed here on stability and quick energy dissipation. As just being beautiful and practical would not be enough for Finite Elemente. They have their reputation to think of, and the question as to furniture or rack is somewhat moot. "Modul" elements are hi-fi furniture with audiophile aspirations.

be popular with those who prefer to conceal their cable connections rather than show them off proudly. It is also possible to integrate a mains connection and even a fan, and this could be useful if you are running components behind closed flaps. Full operability is still ensured with the IR link module that transmits remote control signals to the inside of the furniture unit. It becomes a modular sound system when you add the stereo and centre loudspeakers with subwoofer developed by T+A.

Quality down to the last detail: With the "Modul" range Finite Elemente is looking to take its place in the premium class of audio furniture



Modul LS can actually do, is not revealed here though.

It is difficult to say what contribution to the overall result is made by the materials, the drivers, the semi-active operation or the energy policy. It can however be said that we recognised essential characteristics of Finite Elemente's racks in the unfussy and straightforward performance of the Modul LS where the depiction is so honest and stable also in respect of localization and spatial plasticity. Components are reproduced taut and natural, spatial and rich in detail as well as more slim and cleansed rather than round and comfortable. And that is why we like working with them. And what does our large Pagode Master Reference rack stand on? On a set of Cerabases, of course, which in a slightly amended form is also the basis for the Modul LS, weighing in at around 58 kilos. It might be made up of modules, but the musical performance is like a perfectly tuned two-piece ensemble.

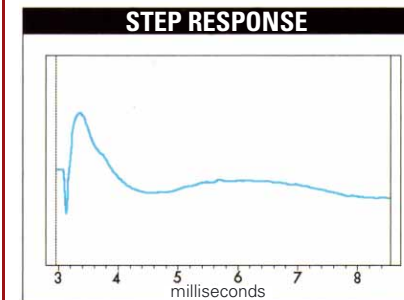
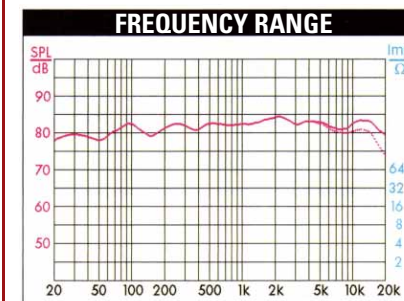
FINITE ELEMENTE MODUL LS



Size: 26.5 x 110 x 56.5 cm (WxHxD, including pedestal)
Warranty: 5 years
Manufacturer: Finite Elemente
Tel.: ++49 (0)2961-966110
www.finite-elemente.de

Detractors might claim that the Modul LS is nothing more than the loudspeaker to match the furniture range. In fact it is a high-end product in all respects with an unusually elaborate cabinet design and a reproduction that is time-stable to the point of excess, gruff and neutral. Perfect in every respect. Excellent!

LABORATORY



The Modul LS offers a perfectly depicted frequency range. The fluctuations are in the range of +/- two decibels. It is astonishing that the loudspeaker gets down to 20 Hz despite the small volume of its woofer section. All thanks to active equalization! The omnidirectional behaviour is average (dotted line). In the listening test we directed the Modul speaker to the ears, which confirmed the measuring engineering. In practice the trebles can be influenced by adjusting the angle. The step response shows an excellent behaviour. All drivers work simultaneously, and no resonance is discernible.

STEREO-TEST

SOUND QUALITY 95%
VALUE FOR MONEY
★★★★☆
EXCELLENT

loud quiet
small large
active passive
high low
near far
sound space
classical modern



modul ls – a loudspeaker by finite elemente, with 1000 watts very active in the low frequencies, easily getting down to 15 Hz, offering unbelievable spatiality with a resolution revealing the finest details, but still very small in size, perfectly adaptable to the room acoustics and a perfect match to the modul® audio furniture system in your living environment.



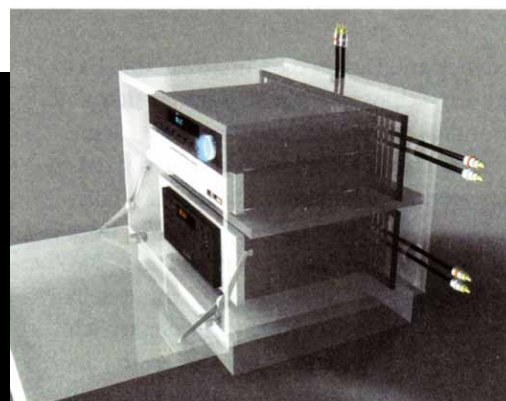
finite elemente
www.finite-elemente.de

Bernd Brockhoff (l.) and Luis Fernandes from Finite Elemente with a complete "Modul" system

Racks or furniture?

The Modul range is not designed to appeal only to living-room aesthetics, but should also "sound good".

To present multimedia technology adequately, whilst still making this suitable for everyday applications and living environments, is the goal that Finite Elemente has set with the "Modul" audio furniture range. As the name says, this is a modular system that the manufacturers claim can offer 1001 possibilities. First of all you are confronted with clear designs, fine quality materials and clever



The "integrated cable management" conceals all cabling so that the units can also be used as room dividers

The German specialists T+A supply the loudspeakers and the active subwoofers for the "Modul Soundsystem" to ensure that the sound matches the appearance

