

REFERENZ SELECTION

HANDMADE CABLES



inakustik

KABEL | LAUTSPRECHER | MUSIK

FOR THE



SENSES

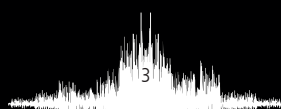


REFERENZ SELECTION

True sound experiences captivate, give you goosebumps or move you to tears. But only cables that have been perfected down to the last detail are able to transport this truly sensuous pleasure without interference. We at in-akustik are pioneers in perfect signal transmission, helping to convey the finest nuances that appeal to all senses. We put passion, ambition and love into the development and production of our cables, which are known throughout the world for outstanding quality. The ultimate proof for this is Referenz Selection. Dynamics, power and precision cannot be more clearly sensed with any other product range. That's why these cables are only available in select specialised stores.

🌐 „A stroke of genius that also shows the competitors the limits. | Processing: outstanding“
Audio 12-2018 | LS-1204 AIR

Background	4
Our Philosophy	8
Key Technologies	10
Speaker Cables	14
Cable Bases	27
Gel Absorber	28
BiWire Jumper	29
Audio Cables	30
Phono Cabel	36
Digital Cable	38
Power Station	39
Product Overview	40





⚠ Many elaborate separation processes are needed to make conductive copper from copper ore. For Referenz Selection, only highly pure batches are used.

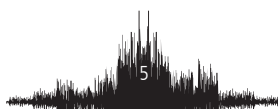
PERFECT SOUND BEGINS IN THE MINE



It is a long way from the sound source to the ear. It starts somewhere in the world in one of the mines in which copper ore is mined. From there the material is delivered to Germany, liquefied in melting pots in copper smelting plants in northern Germany and separated from impurities like phosphorus and iron. Only then is it poured into bars. But the raw copper is not yet suitable for electronic applications.

In order to create the purest possible, most conductive copper, the valuable raw material must first be placed in an electrolysis bath. The oxygen-free copper is again melted down, poured into a copper wire approximately 10 millimetres thick and wrapped into coils. In strict quality control tests, material samples are then examined and sorted according to their purity.

For Referenz Selection, only select, highly pure batches are used. Only after this pure material is found in elaborate processes is the copper drawn to the required diameter in several stages in the wire-drawing mill and later provided with our DUO-PE II insulation in a German cable mill. After that it is stranded with air-filled PE tubes and enveloped with the PE network jacket. And after all of this has happened, it comes to us – to in-akustik in Ballrechten- Dottingen – for the final steps and finishing.





✦ A Referenz Selection cable is manufactured in many manual steps that are often meticulous and elaborate.



HANDMADE

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We have long set the bar very high in regard to quality, because cables and connections are extremely sensitive. Physical phenomena that arise during the transmission of signals can only be controlled with technical finesse and the best materials. For this reason all cables are manufactured in a German cable mill and finished by us in Ballrechten-Dottingen in elaborate manual work. Some production steps are carried out in close cooperation with the Caritas workshops in our neighboring town Heitersheim.

For our Referenz Selection cables, we also offer an after sales service. For technical questions regarding the product or the right cable connection, please contact our support team directly. You can contact our experts Monday to Friday from 9–12 a.m. and 13–17 p.m. on the telephone number +49 (0) 7634 5610-70. In addition, we grant to all Referenz Selection cables extended warranty to 5 years. Please follow the instructions on the warranty card supplied with the product.

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PHYSICS NOT VOODOO



In physics lessons they taught us that an electric circuit only needs two wires – one for positive and one for negative. The lamp lights up and everything's fine. A standard lamp isn't any brighter or an iron any hotter if it has a different lead.

However, there are crucial differences between simply supplying power and highly complex information transfer. A loudspeaker cable is great example of this. It has to carry both energy and information. Loudspeakers can also be moody little beasts, with a very dynamic electrical life of their own. They behave differently for every tone and volume and have to be constantly kept in check by the amplifier. This means the signal on a loudspeaker cable is a jumble of tiny to huge levels, alternating current and voltage of different frequencies and phase levels. To faithfully transmit the extremely fine details that define sound and space and give the music feeling, the cable has to metaphorically keep the speaker as close as possible to the amplifier.

Elsewhere in the hi-fi chain, cables have to deal with other phenomena and overcome different challenges. This means the cables must be designed differently so that the system doesn't just sound good, but the components are able to perform at their very best.

What must these cables be like? A more detailed look at the electronics literature reveals that two simple wires are not enough. Cables act like filters that have to be tuned.

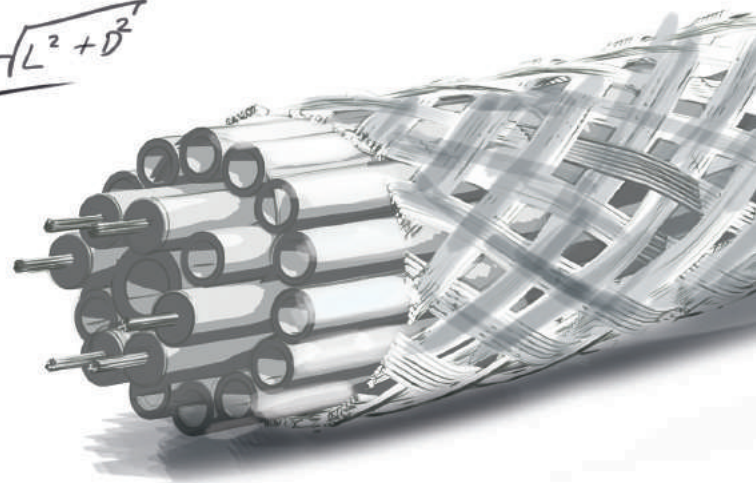
However, it's a long way from theoretical models and sketches to actual products. Samples are manufactured and optimised. Materials, design and manufacturing processes are coordinated, and tools and test equipment are built. Because we have our own cable factory and produce in-house, we can try out the craziest and most innovative ideas. This means we have built up plenty of expertise and experience over the years. Now, we can develop components using 3D CAD.

All this has led to another milestone in the history of our developments: the Air-Helix.

Wachsmann

Holger Wachsmann
Product development

$$L' = \sqrt{L^2 + D^2}$$



"A REAL INNOVATION IN CABLE DESIGN"

STEREO 09-2015

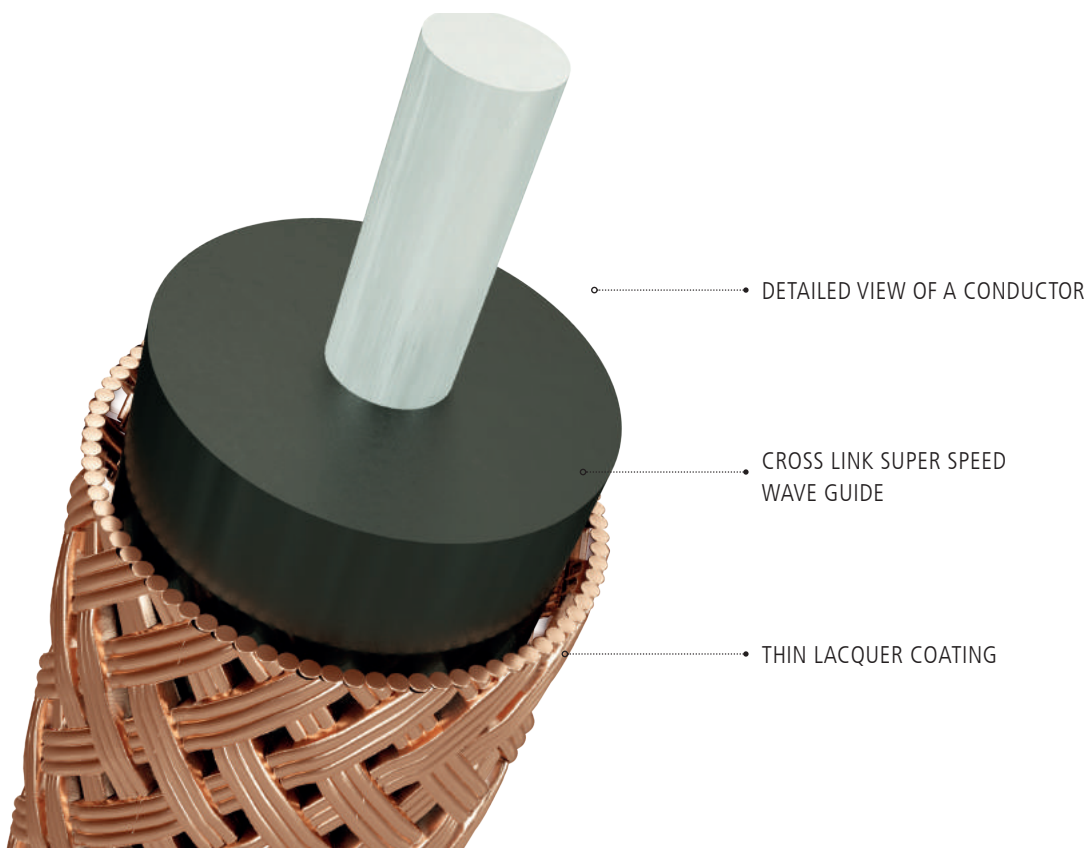
AIR HELIX DESIGN

AIR DIELECTRIC
ensures extremely low
capacitance

LS-2404 AIR
8 single conductors
24 x 0,25mm copper wires

WHOLLY UNIQUE AIR HELIX DESIGN

The air-helix construction is wholly unique. We have developed a special clip to ensure air insulation that is as close to perfection as possible. A large number of these clips form the supporting structure on the inside of the cable. This holds the signal conductor free in the air in a helix form and guides it through the cable at defined intervals. The flexibility of this construction is attained with two bridges that hold the clips together evenly and at exact intervals. The Cross Link Super Speed waveguides are threaded and fitted with clips by hand with extreme care in our own manufacturing unit. Afterwards the air-helix created in this manner is given its PE network jacket – again by hand. Finally the rhodium-coated plugs are fitted and the cable function is tested



MAKE WAY

CROSS LINK SUPER SPEED WAVE GUIDE

The conductors themselves of course also play a major role. The LS-4004 AIR and LS-2404 AIR are made of 24 highly pure copper wires braided on a PE core. An exceedingly thin coating layer on the wires prevents eddy currents inside this Cross Link Super-Speed Waveguide – the rigorous further development of the super-speed waveguide. This conductor is also used in the NF-2404, but it is considerably more effective in the LS-2404 AIR. The reason for this is that by far the largest currents in the entire audio chain flow through the loudspeaker cables. Part of the correspondingly strong magnetic fields are already compensated by the eight wires on their own. This is ensured by the braided and therefore opposed stranding of the individual wires. Their wafer-thin lacquer coating insulates the wires from each other. The structure ensures greater stability and “peace” in the conductor.



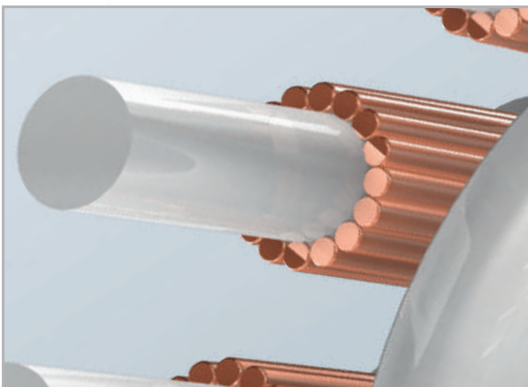
TECHNOLOGY IN ITS FINEST FORM

DOUBLE LAYER MULTICORE



The finding that the loudspeaker cable should primarily have a low inductivity has been optimally implemented in the LS-2404 AIR: The two-layer arrangement of the double-layer multicore allows the conductors to overlap and neutralise the magnetic fields that arise around the individual conductors. This considerably reduces the inductivity of the cable and also allows the high sound frequencies to be transferred without hindrance or time delays.

SUPER SPEED & HIGH SPEED WAVE GUIDE



As the frequency rises, the signal increasingly flows on the conductor surface. The higher the frequency, the lower the effective cross-section, and the greater the resistance. The cable sounds "bass-heavy". The conductors from the Referenz speaker cable have a core made of polyethylene. In this way a circular waveguide is formed and the actual cross-section used is the same for all sound frequencies. On the Super Speed waveguides, a layer of lacquer insulates the copper wires from each other and prevents unwanted eddy currents. The result: a homogeneous, balanced speaker cable with a wide-ranging sound spectrum.

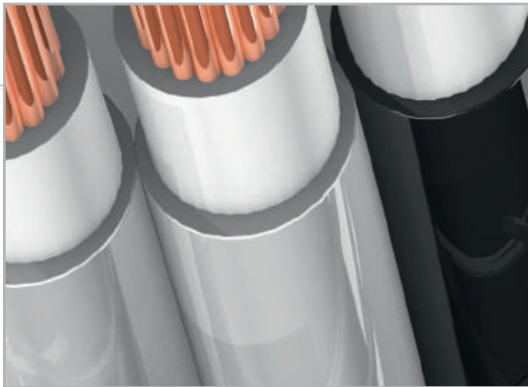
PE-NETWORK JACKET



The tightly fitted PE network jacket holds the wires close together and reduces micro-vibrations that arise in the cable from the changing magnetic fields caused by the beat of the music. The cable therefore also transmits high levels and extreme dynamic peaks with absolute precision.

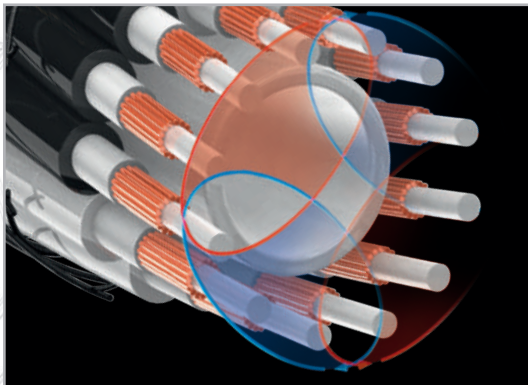


DUO-PE II INSULATION



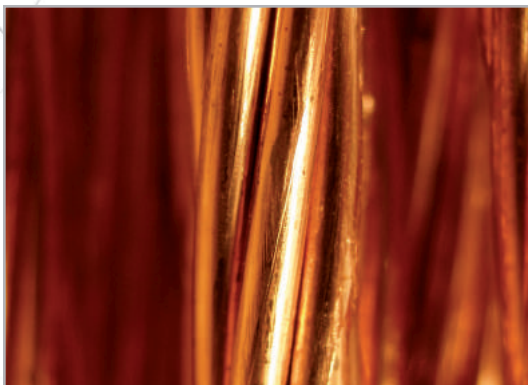
Theoretically, air is the best insulator, and polyethylene is also excellent in practice. For Referenz cables, in-akustik developed insulation consisting of two layers of polyethylene. The first layer is foamed with air. A second, solid PE sheath is applied over that. This DUO-PE II insulation prevents high capacitance and eases the work for the electronics.

MULTICORE



The flow of current causes magnetic fields to be created in the cable, leading to a partial loss of power. High frequencies are slowed down – and time lag is created between low and high sound frequencies. The circular arrangement of several wires around the polyethylene support causes the magnetic fields of plus and minus conductors to overlap and neutralise each other. The high sound frequencies are transported unhindered and synchronously.

COPPER



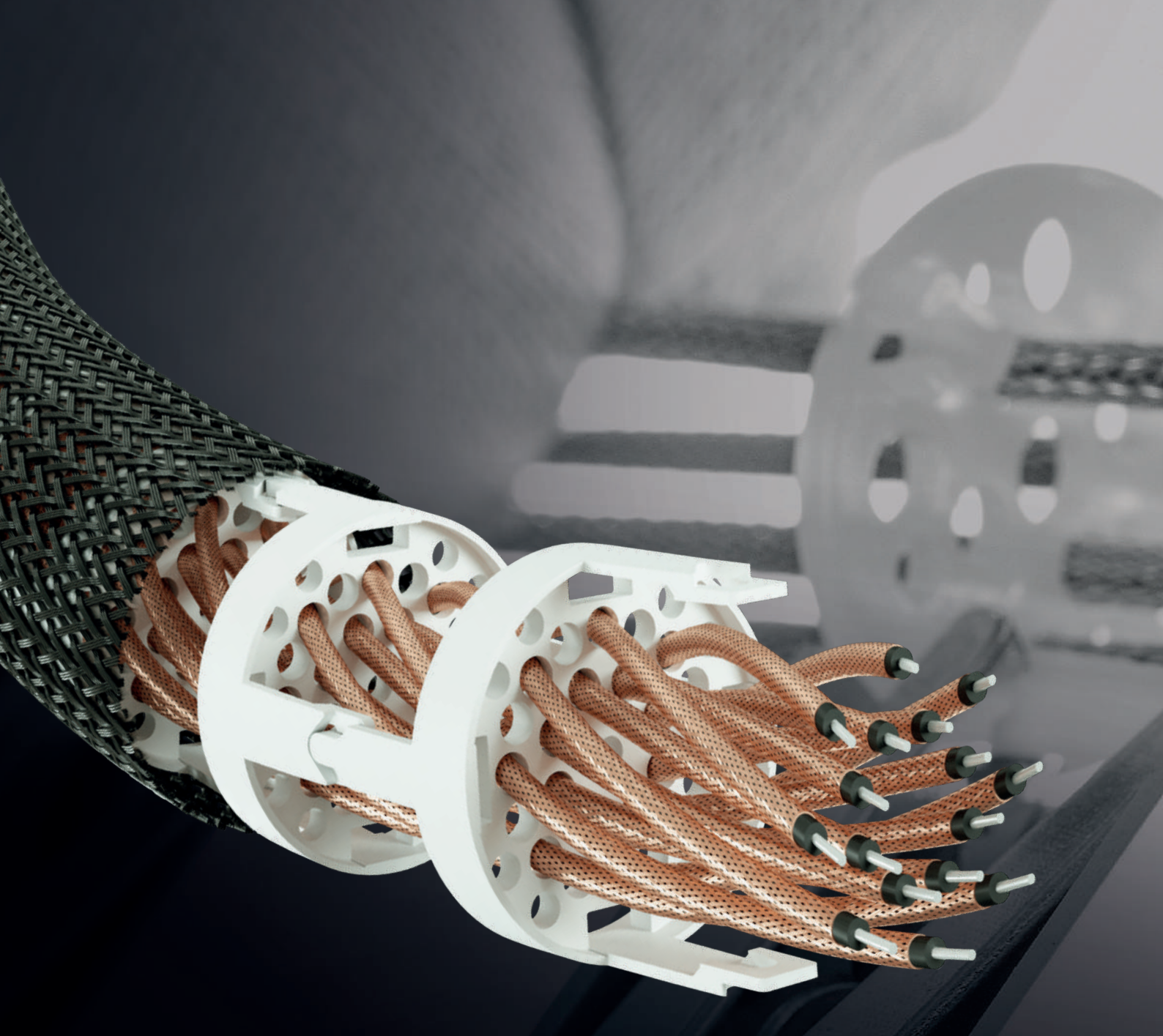
The transmission of acoustic signals is susceptible to many different types of interference: resistance, inductance, capacitance, conductance of the insulation and skin effect have a negative influence on the sound. The conductor material is also very significant. Because every contamination in the conductor material prevents the flow of current, impairing the conductance and increasing the background noise. That's why we use only especially pure, oxygen-free copper (OFC) with a high conductance in our Referenz cables.

$$\alpha = \frac{360}{2}$$

$$R_n = \frac{r}{\sin(\frac{360}{2})}$$

$$L_i = R_n - r$$





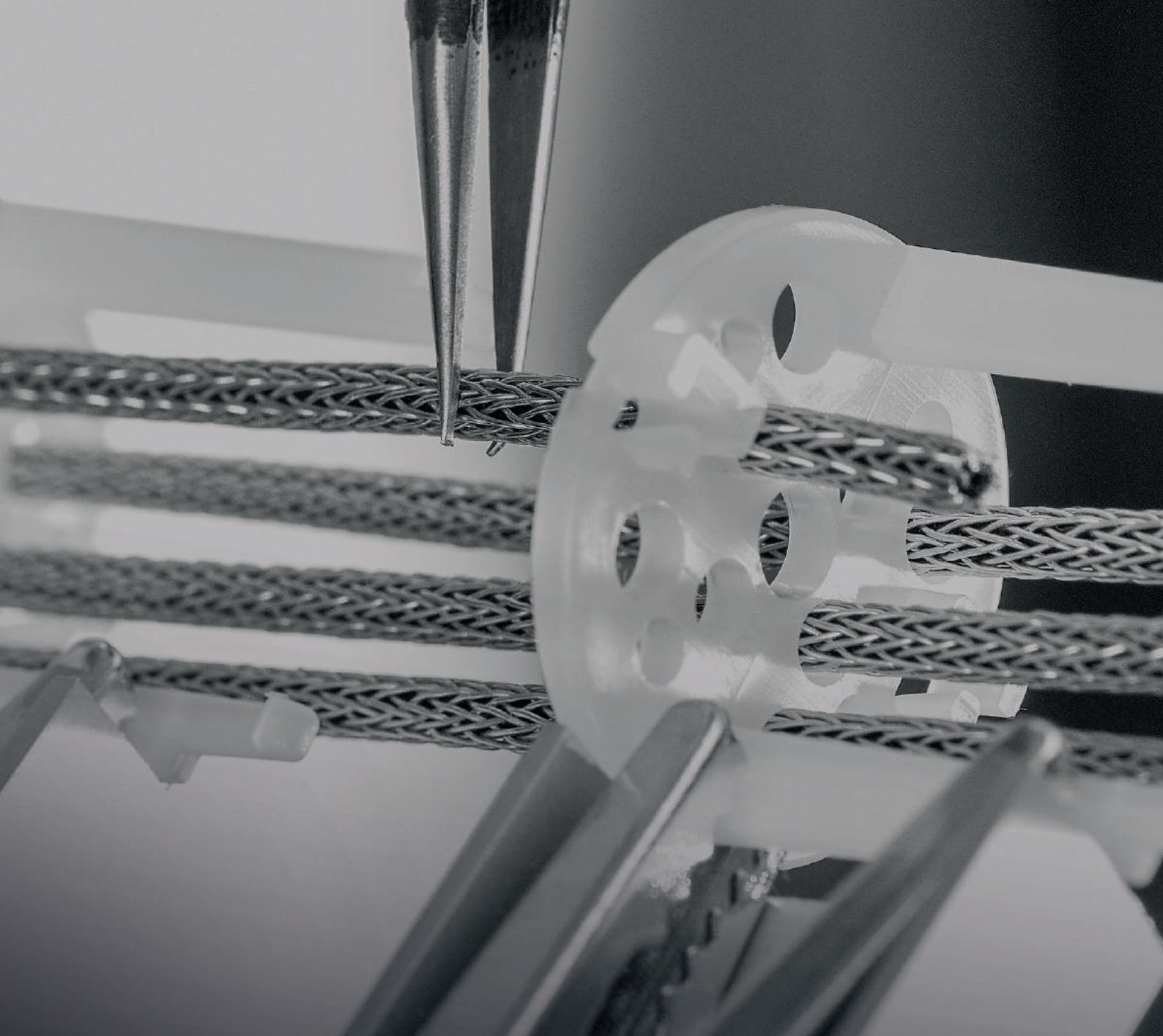
SPEAKER CABLE

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A heavenly CD by legendary artists. Listen and adore. If only it was that easy. By the time the first note reaches your ear, it has travelled a long way. The longest leg being between amplifier and speaker, with any number of obstacles. The signals are vulnerable to many distortions. We can prevent this. Ingenious conductor engineering, complex shielding and only the best materials. And we can also confirm this with independent test results from throughout the world.

🎧 "It's difficult to describe – you have to experience it yourself. Or to put it in terms of money, a hi-fi combination worth €20,000 can be improved by 20% simply with the LS-2404 AIR. That amounts to an extraordinary value." *Stereoplay 01-2017*

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REFERENZ LS-4004 AIR PURE SILVER

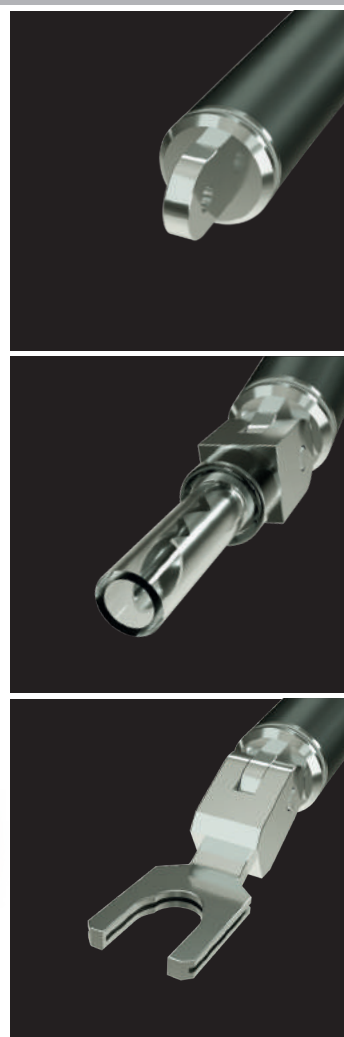
The AIR technology is a milestone in our more than 40-year company history and is causing a worldwide sensation in the hi-fi industry. The approach sounds relatively banal: Physical losses must be minimized in order to transmit the original music signal as unchanged and neutral as possible. And AIR technology comes closer than ever to lossless transmission. It leads to significantly better sound reproduction, which is not only subjectively audible, but also objectively measurable. The insulation or dielectric of the AIR cables is almost perfect thanks to the air insulation and hardly influences the sound any more. The construction, dimensions and arrangement of the conductors are optimized and fully exploit what is physically feasible.



In order to set another sonic highlight on this basis of audiophile perfection, we have now focused on the conductor material of the cables. Copper of the appropriate purity is a very good conductor. A superconductor that does not resist the current would be perfect. However, the superconducting properties of the material require low temperatures of at least minus seventy degrees. Silver is currently the most conductive material under real conditions. At 61.35 S/m (Siemens per meter), its conductivity is about six percent better than that of copper. However, the precious metal is about 100 times more expensive.

KEY-FEATURES

- PURE SILVER CONDUCTOR
- AIR HELIX DESIGN
- AIR DIELECTRIC
- DOUBLE LAYER MULTICORE
- 16 X CROSS LINK SUPER SPEED WAVE GUIDE
- LACQUERED WIRES
- PE-NETWORK JACKET
- PLUGS MADE OF TELLURIUM COPPER;
RHODIUM-COATED
- ANGLE OF PLUGS ADJUSTABLE
- PRESSURE-GROUTED PLUGS (1.5 T PRESSURE!)
- BFA BANANA AND SPADES INCLUDED IN THE SET



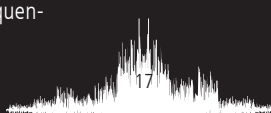
You can find a summary of the various connection options on page 40.

THE CONDUCTORS

Of course, the conductors themselves also play an important role. They consist of 24 high-purity silver wires braided onto a PE core. A wafer-thin varnish layer on the wires prevents eddy currents within this „Cross Link Super Speed“ waveguide. By far the largest currents in the entire audio chain flow through the loudspeaker cable. Some of the correspondingly strong magnetic fields are compensated in the conductors themselves by the bifilar arrangement of the wires. The wafer-thin lacquer layer additionally protects the wires from oxidation. The LS-4004 AIR PURE SILVER is the optimal solution for the realization that loudspeaker cables should primarily have a low inductance: Due to the two-layer arrangement of the double layer multicore, the magnetic fields around the individual conductors overlap and neutralize each other. This considerably reduces the inductance of the cable and also the high audio frequencies are transported unhindered and without time delay.

EXPAND THE LIMITS

Theoretically, the copper cross-section could simply be increased. However, this would require considerable compromises in cable construction, which would ultimately have a negative effect on the sound. That is why we have decided to deliberately disregard the costs and instead consistently expand the limits of what is feasible once again. The result is a combination of the legendary AIR Helix construction and the associated air insulation (the best possible dielectric in addition to the vacuum) with the best conductor material in the form of pure silver - instead of, for example, alloyed or merely silver-plated wires. The high quality sound of the outstanding AIR-Silver cables now sets new standards in the high-end sector.



REFERENZ LS-4004 AIR

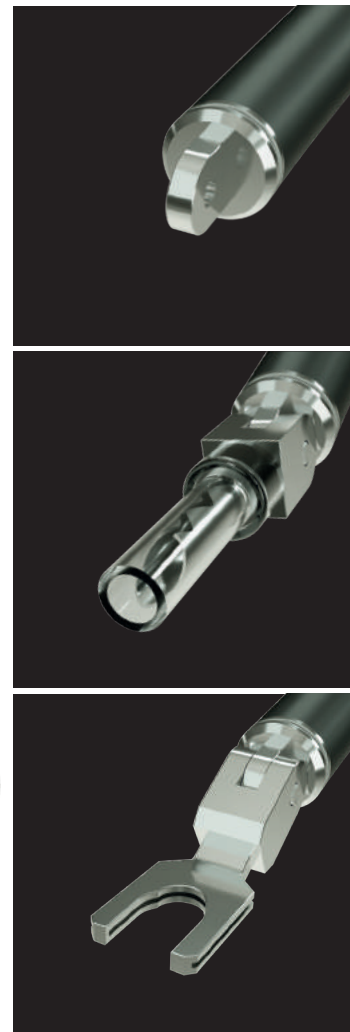
With the Referenz LS-4004 speaker cable, we continue the incredible story of their Air Helix technology: To achieve perfect air insulation, the new cable uses no less than 16 Cross Link Super Speed waveguides (rather than eight as with the Referenz Air Helix LS 2404). Obviously, the individual conductors themselves play a key role, too. With the LS-4004, too, these are made of 24 high-purity copper wires, each with a razor-thin lacquer coating for extra insulation and braided around a PE core. This design considerably increases stability inside the waveguide by effectively preventing the formation of eddy currents. (These are caused by the very high currents transmitted on the speaker cables - actually the highest ones within the entire audio path.)



The LS-4004 AIR is a perfect example of a low-inductance speaker cable: The double-layer multicore design leads to a neutralization of overlapping magnetic fields around the individual conductors. This considerably reduces cable inductance, ensuring that all frequencies are transmitted freely and without any latency. Plus a full range of connector options offers maximum flexibility.

KEY-FEATURES

- AIR HELIX DESIGN
- AIR DIELECTRIC
- DOUBLE LAYER MULTICORE
- 16 X CROSS LINK SUPER SPEED WAVE GUIDE
- LACQUERED WIRES
- PE-NETWORK JACKET
- PLUGS MADE OF TELLURIUM COPPER; RHODIUM-COATED
- ANGLE OF PLUGS ADJUSTABLE
- PRESSURE-GROUTED PLUGS



You can find a summary of the various connection options on page 40.

THE PLUGS

We have opted for tellurium copper as the plug base material rather than brass. This is because tellurium copper offers twice the conductivity. Each plug comprises a basic terminal with a spade or BFA banana adapter laterally threaded to it. This connector design provides maximum flexibility with regard to adjusting the angle between the cable and the connector and also mitigates the effects of mechanical forces acting on both the cable and the connector including their contact interfaces. The connector surfaces are rhodium-coated because this extremely robust material ensures optimum contact even after many mating cycles.

A ROCK-SOLID CONSTRUCTION

Between the aluminum splitter and the connectors of the LS-4004 AIR, we have implemented ultra flexible parts molded from a special elastomer. These parts are fixed inside the splitter using a specifically designed plastic plug, thus ensuring maximum cable flexibility even in the connector region. Those molded parts extend to the connector front and enclose the inner connector components, thus emphasizing the plain yet charming appearance of the LS-4004 AIR. The aluminum splitters are screwed tightly with the first clip in the cable. In summary, this creates a visually appealing and mechanically reliable design - consistent from the connectors on the amplifier side to their counterparts on the speaker side.

REFERENZ LS-2404 AIR PURE SILVER

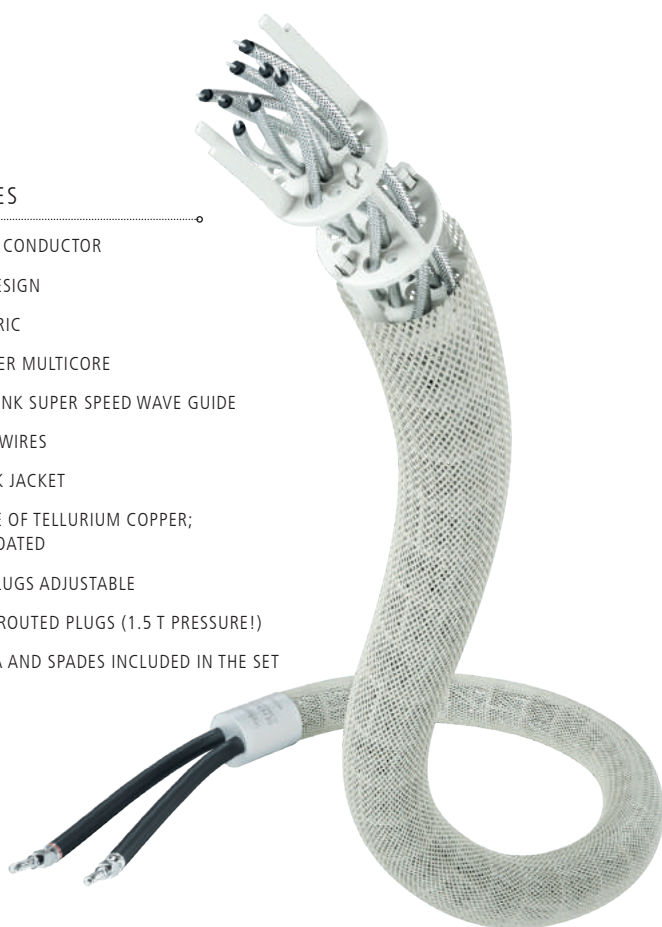
The LS-2404 Pure Silver has the same features as the flagship LS-4004 AIR Pure Silver. The only difference is the number of conductors - cable construction, design as well as the physical approach are identical: Physical losses must be minimized in order to transmit the original music signal as unchanged and neutral as possible. And AIR technology comes closer than ever to lossless transmission. It leads to significantly better sound reproduction, which is not only subjectively audible, but also objectively measurable. The insulation or dielectric of the AIR cables is almost perfect thanks to the air insulation and hardly influences the sound any more. The construction, dimensions and arrangement of the conductors are optimized and fully exploit what is physically feasible.



In order to set another sonic highlight on this basis of audiophile perfection, we have now focused on the conductor material of the cables. Copper of the appropriate purity is a very good conductor. A superconductor that does not resist the current would be perfect. However, the superconducting properties of the material require low temperatures of at least minus seventy degrees. Silver is currently the most conductive material under real conditions. At 61.35 S/m (Siemens per meter), its conductivity is about six percent better than that of copper. However, the precious metal is about 100 times more expensive.

KEY-FEATURES

- PURE SILVER CONDUCTOR
- AIR HELIX DESIGN
- AIR DIELECTRIC
- DOUBLE LAYER MULTICORE
- 8 X CROSS LINK SUPER SPEED WAVE GUIDE
- LACQUERED WIRES
- PE-NETWORK JACKET
- PLUGS MADE OF TELLURIUM COPPER;
RHODIUM-COATED
- ANGLE OF PLUGS ADJUSTABLE
- PRESSURE-GROUTED PLUGS (1.5 T PRESSURE!)
- BFA BANANA AND SPADES INCLUDED IN THE SET



You can find a summary of the various connection options on page 40.

THE CONDUCTORS

Of course, the conductors themselves also play an important role. They consist of 24 high-purity silver wires braided onto a PE core. A wafer-thin varnish layer on the wires prevents eddy currents within this „Cross Link Super Speed“ waveguide. By far the largest currents in the entire audio chain flow through the loudspeaker cable. Some of the correspondingly strong magnetic fields are compensated in the conductors themselves by the bifilar arrangement of the wires. The wafer-thin lacquer layer additionally protects the wires from oxidation. The LS-2404 AIR PURE SILVER is the optimal solution for the realization that loudspeaker cables should primarily have a low inductance: Due to the two-layer arrangement of the double layer multicore, the magnetic fields around the individual conductors overlap and neutralize each other. This considerably reduces the inductance of the cable and also the high audio frequencies are transported unhindered and without time delay.

EXPAND THE LIMITS

Theoretically, the copper cross-section could simply be increased. However, this would require considerable compromises in cable construction, which would ultimately have a negative effect on the sound. That is why we have decided to deliberately disregard the costs and instead consistently expand the limits of what is feasible once again. The result is a combination of the legendary AIR Helix construction and the associated air insulation (the best possible dielectric in addition to the vacuum) with the best conductor material in the form of pure silver - instead of, for example, alloyed or merely silver-plated wires. The high quality sound of the outstanding AIR-Silver cables now sets new standards in the high-end sector.

REFERENZ LS-2404 AIR

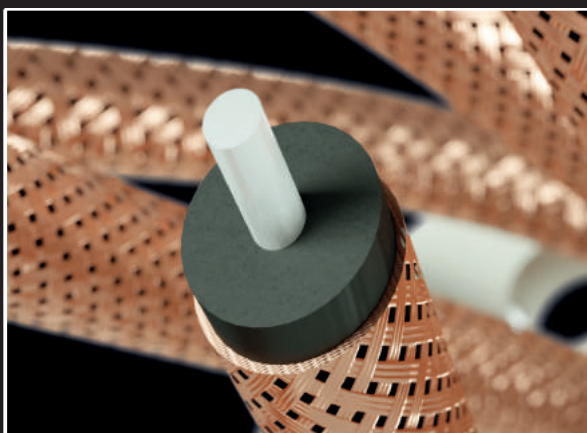
The new Reference LS-2404 AIR loudspeaker cable combines the outstanding qualities of its predecessor – the LS-2404 – and the almost legendary NF-2404 audio cable. This has resulted in a loudspeaker cable that not only has the all-important low inductivity necessary for its application, but also low capacity values and low dielectrical losses. Interdependencies have been reduced and the amplifier can function in a more detached manner. Even if this may seem paradoxical: Thanks to the innovative air insulation, high fidelity becomes a simply breath-taking sound experience with this cable.

KEY-FEATURES

- AIR HELIX DESIGN
- AIR DIELECTRIC
- DOUBLE LAYER MULTICORE
- 8 X CROSS LINK SUPER SPEED WAVE GUIDE
- LACQUERED WIRES
- PE-NETWORK JACKET
- PLUGS MADE OF TELLURIUM COPPER; RHODIUM-COATED (MKII-VERSION)
- ANGLE OF PLUGS ADJUSTABLE (MKII-VERSION)
- PRESSURE-GROUTED PLUGS (1.5 T PRESSURE!)



You can find a summary of the various connection options on page 40.



CROSS LINK SUPER SPEED WAVE GUIDE

The conductors themselves of course also play a major role. The LS-2404 is made of 24 highly pure copper wires braided on a PE core. An exceedingly thin coating layer on the wires prevents eddy currents inside this Cross Link Super-Speed Waveguide – the rigorous further development of the super-speed waveguide. This conductor is also used in the NF-2404, but it is considerably more effective in the LS-2404 AIR. The reason for this is that by far the largest currents in the entire audio chain flow through the loudspeaker cables. Part of the correspondingly strong magnetic fields are already compensated by the eight wires on their own. This is ensured by the braided and therefore opposed stranding of the individual wires. Their wafer-thin lacquer coating insulates the wires from each other. The structure ensures greater stability and "peace" in the conductor.

REFERENZ LS-1204 AIR

In our quest to find true air insulation, we have certainly set standards with our Reference series for high end audio. Our unique Air Helix technology leads the way to unspoiled audio transmission. Now we have added two top notch Reference Air Helix cables for the high end audiophile that is on a budget. The LS-1204 AIR is for every aspiring music aficionado and they can benefit from this high tech design. Thanks to air insulation, enjoying hi-fi sound becomes literally a breath taking experience. References cables with our innovative Air Helix design has enthralled numerous high end enthusiasts around the world as well as the trade press.

KEY-FEATURES

- AIR HELIX DESIGN
- AIR DIELECTRIC
- DOUBLE LAYER MULTICORE
- 4 X CROSS LINK SUPER SPEED WAVE GUIDE
- LACQUERED WIRES
- PE-NETWORK JACKET
- PLUGS MADE OF TELLURIUM COPPER;
RHODIUM-COATED
- PRESSURE-GROUTED PLUGS (1.5 T PRESSURE!)



A STROKE OF GENIUS

„A stroke of genius that also shows the competitors the limits. Processing: outstanding“ Audio | 12-2018

Built for interconnecting true „reference“ high end devices they can certainly make more than just a small difference in the sound of best-in-class audio systems. The LS1204 AIR is tailored to the needs of many small but yet high end systems and the budget of their owners. Carefully crafted with outstanding properties, these cables help any high end system produce the perfect sound.

REFERENZ LS-2404

In addition to the waveguide design (third Generation LS-1603 & LS-1203), where the individual copper wires are arranged around a polyethylene core, in the fourth generation the copper wires are lacquered as insulation from each other. This prevents chaotic and undefined contact between the copper wires, which might otherwise lead to uncontrolled eddy current. As well as this, the new cables are characterised by extremely low inductivity. A total of 24 Super Speed waveguides are wound through the LS-2404. They form a multi-core structure where the magnetic fields of the forward and return conductors caused by the signal current cancel each other out, thus significantly reducing unwanted inductivity.

KEY-FEATURES

- 24-FOLD MULTICORE
- SUPER SPEED WAVE GUIDE
- LACQUER-INSULATED WIRES
- CONCENTRIC COPPER
- DUO-PE II INSULATION
- HIGH POWER MANAGEMENT
- PE-NETWORK JACKET

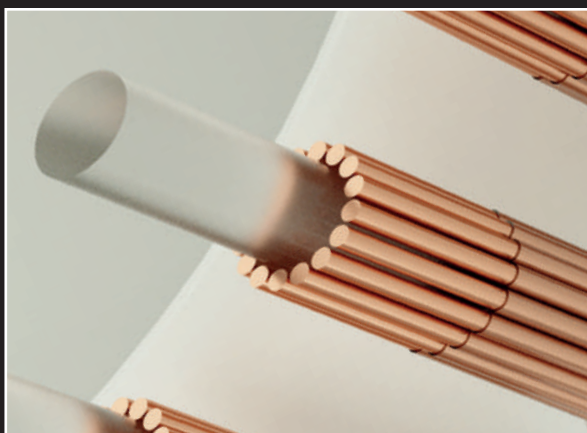


You can find a summary of the various connection options on page 40.



SUPER SPEED WAVE GUIDE

As the frequency rises, the signal increasingly flows on the conductor surface. The higher the frequency, the lower the effective cross-section, and the greater the resistance. The cable sounds "bass-heavy". The conductors from the Referenz speaker cable have a core made of polyethylene. In this way a circular waveguide is formed and the actual cross-section used is the same for all sound frequencies. On the Super Speed waveguides, a layer of lacquer insulates the copper wires from each other and prevents unwanted eddy currents. The result: a homogeneous, balanced speaker cable with a wide-ranging sound spectrum.



REFERENZ LS-1603 SILVER

The LS-1603 Silver controls all facets of the sound spectrum: from the subtle symbol clash of a jazz percussionist to the sententious voice of a female soul singer to the roaring final chord of a symphony orchestra. The basis for this is the specially developed high-speed waveguide technology. Oxygen-free copper (OFC) wires are wrapped around a polyethylene core and provided with the proven DUO-PE II insulation. The LS-1603 Silver has 16 of these high-speed waveguides, which are finely tuned to each other and stranded in groups around a polyethylene support (16-fold multicore).

KEY-FEATURES

- 16-FOLD MULTICORE
- HIGH SPEED WAVE GUIDE
- SILVER PLATED CONDUCTORS
- CONCENTRIC COPPER
- DUO-PE II INSULATION
- HIGH POWER MANAGEMENT
- PE-NETWORK JACKET



You can find a summary of the various connection options on page 40.



SILVER PLATED CONDUCTORS

To augment the high-speed waveguide conductor design, the surface of each individual copper wire is silver-plated. This is a more conductive material for high frequencies that are carried on the conductor surface due to the skin effect, and the complex music signal is carried with less loss. This is yet another fine-tuning for crystal clear sound.

REFERENZ LS-1603

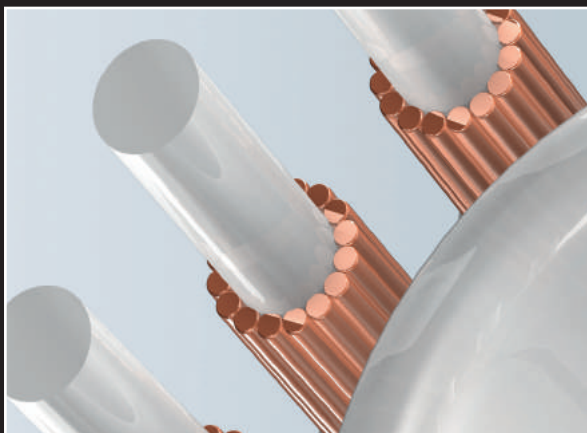
For Referenz Selection cables, the focus is on neutrality in addition to technical finesse. Sounds are reproduced unaltered. As with the LS-1603. It controls all facets of the sound spectrum: from the subtle symbol clash of a jazz percussionist to the sententious voice of a female soul singer to the roaring final chord of a symphony orchestra. The basis for this is the specially developed high-speed waveguide technology. Oxygen-free copper (OFC) wires are wrapped around a polyethylene core and provided with the proven DUO-PE II insulation. The LS-1603 has 16 of these high-speed waveguides, which are finely tuned to each other and stranded in groups around a polyethylene support (16-fold multicore).

KEY-FEATURES

- 16-FOLD MULTICORE
- HIGH SPEED WAVE GUIDE *
- CONCENTRIC COPPER
- DUO-PE II INSULATION
- HIGH POWER MANAGEMENT **
- PE-NETWORK JACKET



You can find a summary of the various connection options on page 40.



HIGH SPEED WAVE GUIDE *

As the frequency rises, the signal increasingly flows on the conductor surface. The higher the frequency, the lower the effective cross-section, and the greater the resistance. The cable sounds "bass-heavy". The conductors from the Referenz speaker cable have a core made of polyethylene. In this way a circular waveguide is formed and the actual cross-section used is the same for all sound frequencies.

HIGH POWER MANAGEMENT **

The signal current produces magnetic fields around each conductor, which pulse in time with the music. If the conductors have not been stabilised, microvibrations occur. The tightly fitted PE-Network Jacket holds the wires close together and reduces microvibrations. Even at high volumes, the cable transmits extreme dynamic peaks with absolute precision.

REFERENZ CABLE BASE

The Referenz Cable bases are specifically designed cabling-support systems for the finest stereo systems. The base incorporates absorber gel, too, plus extra rubber bands accommodating the freely suspended cables. This way, Referenz Cable Bases not only absorb vibrations but consistently isolate your cables from the floor, reducing unwanted capacitance and minimizing the load of the electronic system.

KEY-FEATURES

- MECHANICAL AND CAPACITIVE CABLE DECOUPLING
- SUITABLE FOR CABLE DIAMETERS OF 10 – 25MM
- HIGH-TECH GEL PAD INSIDE THE BASE
- RUBBER BANDS HOLDING THE CABLE
- OPEN OR CLOSED CABLE SUSPENSION
- DIAMETER: 47 MM
- TOTAL HEIGHT: 48 MM
- HEIGHT LEVELS: 25 / 33 / 44 MM



DECOUPLING: LESS TROUBLE, BETTER SOUND

Referenz Cable Bases are highly versatile because they support various cabling diameters and floor gaps as well as open and closed cable suspension. With open suspension, the cable rests on a rubber band and allows for mounting at three different heights; with closed suspension, cables are fixed using two rubber bands above and below. This approach is advantageous in that minor movements (for example, when aligning your speakers) will not result in the cable falling from the Base—it is fixed in a defined position. The innovative cable supports thus ensure effective mechanical and capacitive decoupling of your RCA, XLR, and phono cables from the floor. A particularly interesting application of Referenz Cable Bases is the decoupling of your phono cables. This is essential because otherwise vibrations would travel to your tone arm and on to your sensitive pick-up system.

REFERENZ GEL-ABSORBER

High-end and hi-fi systems are a combination of highly precise and delicate devices. That all components can work without interference, just like sensitive measuring equipment they need to be kept free of vibrations and shocks as far as possible. Vibrations are caused in different ways and they can be transmitted by structure-borne and air-borne noise. The combination of air-borne and structure-borne noise causes all of the components of the hi-fi system to vibrate mechanically. Experiments have shown that this is a considerable impact on the sound. The Reference Hightech Gel Absorbers form a solid sound basis that is available as a combination set for all weight classes. They have a special gel at their core that absorbs vibrations. This set contains 12 gel pads for various weight classes for the optimum tuning and decoupling of the devices and loudspeakers.

KEY-FEATURES

- HIGHTECH ABSORBER GEL
- TOP AND BOTTOM PART MADE FROM STAINLESS STEEL
- 12 (3 X 4) HIGHTECH GEL PADS IN THE SET
- COVERS FOUR WEIGHT CLASSES FROM 5 TO 40 KG
- FELT PADS AND ADHESIVE PADS INCLUDED
- DIMENSIONS APPROX. 45 X 11.5 MM (D X H)



QUALITY NOT QUANTITY

The weight of the devices influences the effectiveness of the absorbers or the absorbent material. In particular the damping ratio alters depending on the frequency and the self-resonance. Therefore it makes sense to adjust the absorber to the weight of the respective component:

Gel pad / device weight (per set of 4)

Green*: up to 5 kg (up to 1.25 kg / absorber)

Blue: 5–10 kg (1.25–2.5 kg / absorber)

Green: 10–20 kg (2.5–5.0 kg / absorber)

Black: 20–40 kg (5.0–10.0 kg / absorber)

* Due to the resonance response, we recommend this gel pad for use in two weight classes.

REFERENZ BIWIRE-JUMPER

High-end bi-wire jumper based on the LS-1603; LS1203 or LS-803. Fitted with the KS-103 Reference spade lug or BFA Banana. The rhodium surface treatment is extremely durable. The contact surfaces and the screw connection are manufactured from a single piece, allowing contact resistance to be avoided. The spade changes shape. The contact surface of the spade, which is slitted on the side, changes to a concave shape when the screw connections are tightened, thus preventing the spade lug from sliding out.

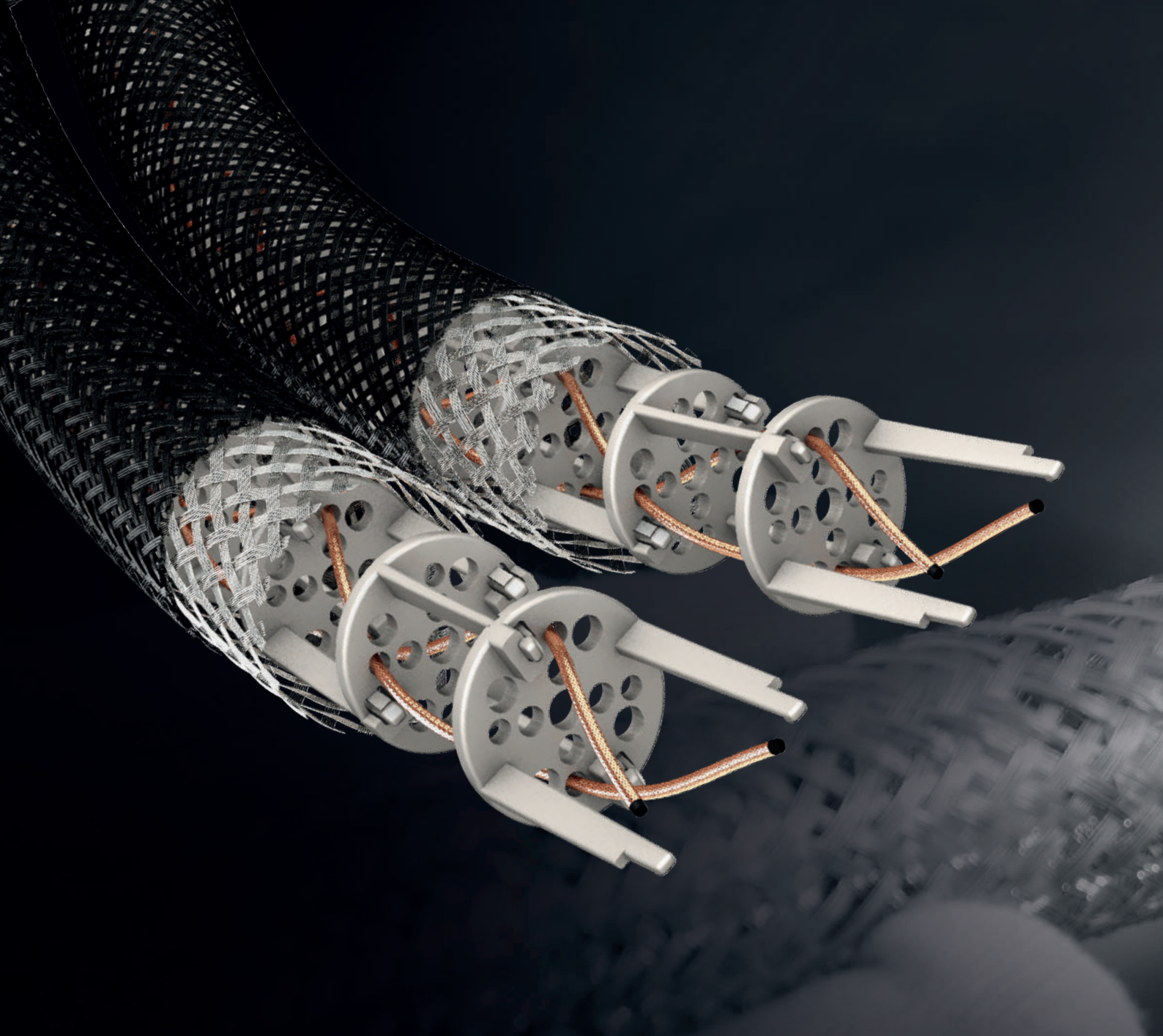
KEY-FEATURES

- 16-FOLD; 12-FOLD OR 8-FOLD MULTICORE DEPENDING ON THE VERSION| LS-1603; LS-1203 OR LS-803
- HIGH SPEED WAVEGUIDE
- CONCENTRIC COPPER
- DUO-PE II INSULATION
- HIGH-POWER-MANAGEMENT
- PE-NETWORK JACKET



RHODIUM COATED CONTACTS

The rhodium surface treatment is extremely durable. The contact surfaces and the screw connection are manufactured from a single piece, allowing contact resistance to be avoided. The spade changes shape. The contact surface, which is slitted on the side, changes to a concave shape when the screw connections are tightened, thus preventing the spade lug from sliding out.



AUDIO CABLE

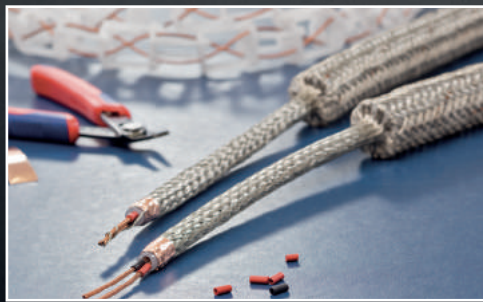
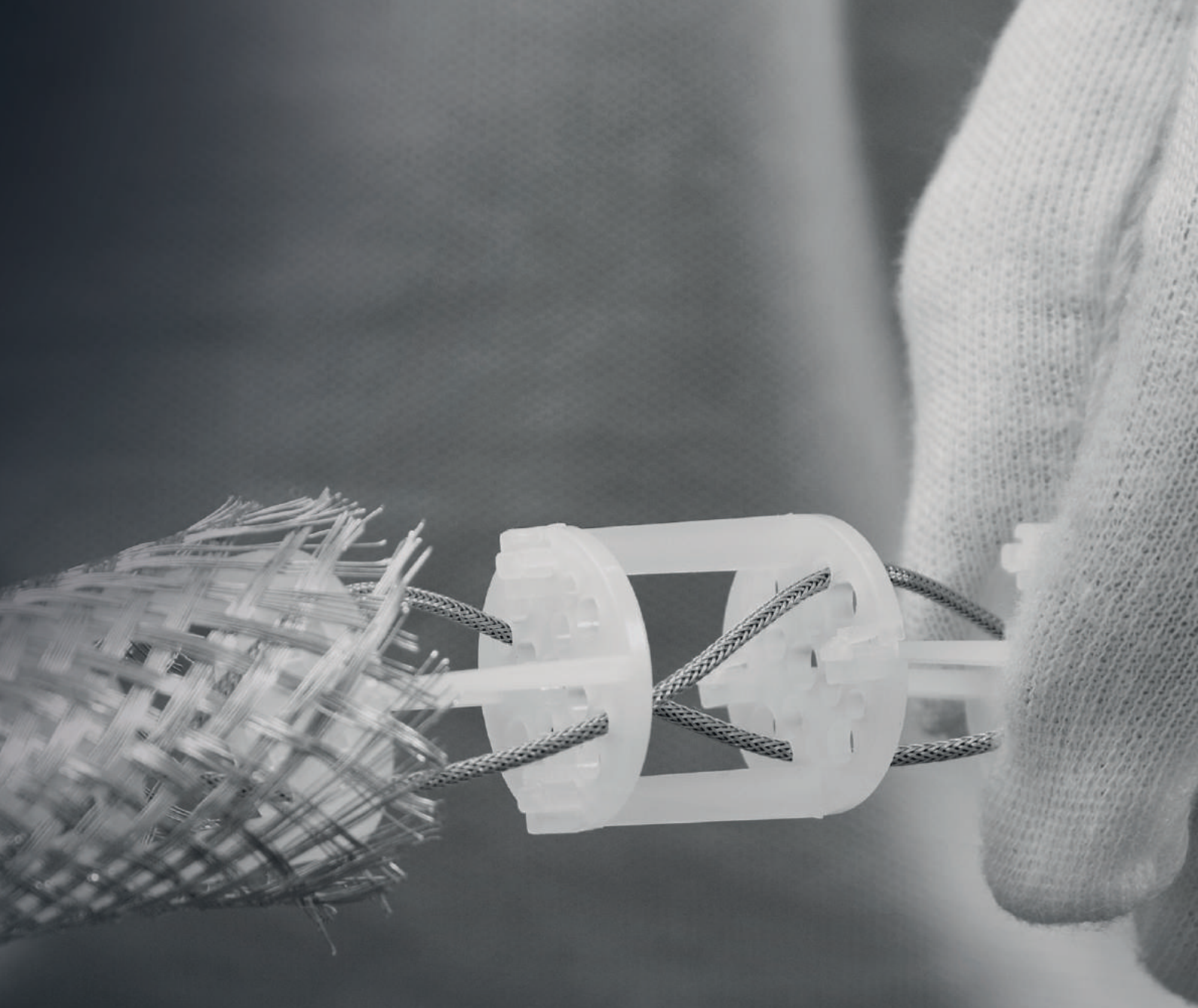
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Every sound begins quite small. Such as a CD or DVD player to send only weak signals. The first steps are therefore particularly vulnerable. Electromagnetic interactions let the delicate tones come easily stumble. Not so with our Audio cables. The in-akustik Referenz cable while helping the small pulses, unadulterated to come up to the amplifier. With intricate designs, select materials and thicker shielding. So every note comes out great.

🎧 "With a real innovation in cable design, In-Akustik's brand-new Referenz NF-2404 equipment combination jumps straight into the premier league — by keeping the conductors at a distance from each other, it gives the music space to breathe." *Stereo* 09-2015

🎧 "The NF-2404 Air RCA cable has magical cubic metres more than a competitor model. A clear vote for the in-akustik alternative." *stereoplay* 01-2017

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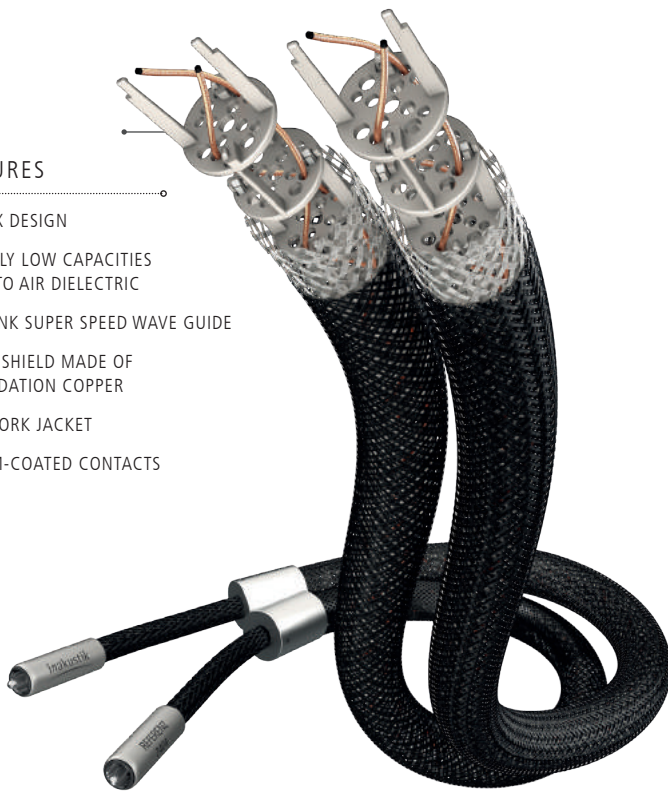
REFERENZ NF-2404 AIR

Breathtaking sound through air insulation - On their way to perfect insulation we have realized many innovative designs - for example, the DUO PE insulation or the PETS (PE tube support). The NF-2404 Air is another milestone along this route and an absolute world first in the cable sector. Normally the conductors are kept apart by filling and insulating material of variable quality. But in the NF-2404 Air, the conductors run through a successive chain of clips that form an inner framework and give the NF-2404 Air extraordinary flexibility for a high-end cable.



KEY-FEATURES

- AIR HELIX DESIGN
- EXTREMELY LOW CAPACITIES THANKS TO AIR DIELECTRIC
- CROSS LINK SUPER SPEED WAVE GUIDE
- BRAIDED SHIELD MADE OF LOW-OXIDATION COPPER
- PE-NETWORK JACKET
- RHODIUM-COATED CONTACTS



You can find a summary of the various connection options on page 43.



GAP RCA PLUG

This newly developed high end plug enables a symmetrical connection to be made up to the terminals of the equipment. Thanks to its two-piece earth ring, this RCA plug has three contacts, exactly like an XLR plug. The screening and negative conductors are only brought together again when at the terminals of the equipment.

HANDMADE

Just like all loudspeaker and audio cables from the Referenz series, the NF- 2404 is entirely made in Germany. The clips are meticulously assembled by hand at the on-site factory and then threaded into the Cross Link Super Speed waveguide. The resulting Air Helix is then provided with a shield and the PE network jacket and finally fitted with GAP-RCA-II or XLR plugs.

REFERENZ NF-1204

With audio connections between individual devices, the cable capacities play a key role. As the signal sources have very low levels and are rather sensitive to high cable capacities, audio cables are perfect candidates to air insulation using the Air Helix technology. For the Referenz NF-1204 Air, we have developed an entirely new and fully solderless RCA-connector design.

KEY-FEATURES

- AIR HELIX DESIGN
- EXTREMELY LOW CAPACITIES
THANKS TO AIR DIELECTRIC
- CROSS LINK SUPER SPEED WAVE GUIDE
- BRAIDED SHIELD MADE OF
LOW-OXIDATION COPPER
- PE-NETWORK JACKET
- PLUGS MADE OF TELLURIUM COPPER;
RHODIUM-COATED
- PRESSURE-GROUTED PLUGS (1.5 T PRESSURE!)
- HERMETIC GROUND CONNECTION



NEW RCA PLUG

The new RCA plug comprises several parts that are assembled only during the manufacture process. First, just like with the speaker cable, the highly-pure copper wires of the Cross Link Super Speed waveguide are mechanically stripped from their thin lacquer coating; then, the tellurium-copper connector pin is crimped onto the wire at a 1.5-t pressure. Another innovation is the shield bonding, which is hermetically sealed using a screw.

REFERENZ NF-1603

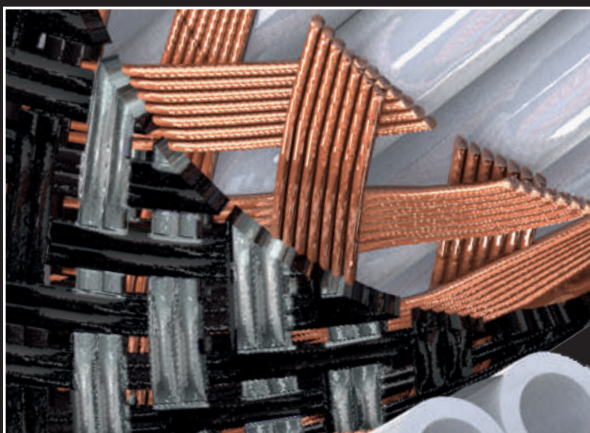
Due to the large effective overall surface of the six high-speed signal conductors, the Referenz NF-1603 becomes a powerful high-end link. At the same time, the DUO-PE II insulation and the air-filled PE tubes reduce unwanted capacitance and enable the signal source to work comfortably. The GAP II screening of the NF-1603 is a combination of lacquer-insulated wires and an aluminium-coated film with an air gap. The screening prevents the formation of interfering eddy currents. Another highlight of the third-generation is the GAP II cinch plugs, which ensure three-way symmetry in this connection. As an alternative, this cable is also available as an XLR version. The PE network jacket also prevents micro-vibrations.

KEY-FEATURES

- TRIPLESYMMETRICAL DESIGN
- HIGH SPEED SIGNAL CONDUCTOR
- DUO-PE II INSULATION
- 16-FOLD PE-TUBE INSULATION
- GAP II SHIELDING
- PE-NETWORK JACKET



You can find a summary of the various connection options on page 43.

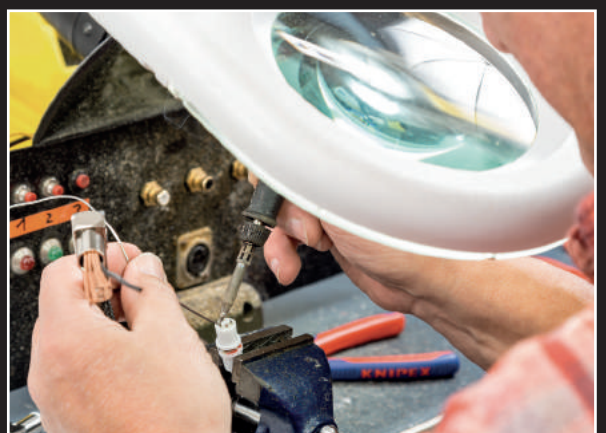


GAP II SHIELDING

The standard shielding of conventional audio cables function like short-circuited secondary circuits. Eddy currents could occur and alter the music signal. The dynamics are diminished and the hi-fi system sounds flat. The GAP II screening consists of lacquer-insulated wires. It prevents the formation of interfering eddy currents.

REFERENZ PHONO - 2404

Nowhere else in the audio world are smaller currents used. And they must be forwarded perfectly. The signal level of an MM or MC system is extremely sensitive, at just a few thousandths of a volt. Additionally, the systems have an inductive character. In combination with the cable capacity, they form what is known as an oscillating circuit, which favours specific frequencies. If these frequencies are unfavourable due to excessively high capacities, this has a major effect on the harmony of the sound. Extremely low capacities and dielectric losses are only two advantages of Reference Phono 2404. They form the basis of your unadulterated enjoyment of your vinyl treasures. There is no finer resolution for the sound of good LPs.



KEY-FEATURES

- AIR HELIX DESIGN
- EXTREMELY LOW CAPACITIES THANKS TO AIR DIELECTRIC
- CROSS LINK SUPER SPEED WAVE GUIDE
- PE-NETWORK JACKET
- RHODIUM-COATED CONTACTS



You can find a summary of the various connection options on page 43.



VINYL TREASURES

The good old LP sounds more alive than ever. Even experts would not have thought this demand possible. The sales of LPs are rising just as surprisingly as those of record players. A boom. But how can the sound be improved? For example, using a new, superior cable between the pick-up arm and the phono amplifier. We at in-akustik have created a new cable for excellent sound – the Reference Phono 2404.

ADDITIONAL PRODUCT DATA

- Symmetrically constructed channels
- Signal-free protective cover
- Braided shield, oxidation protected
- Rhodium-coated contacts
- Earth cable

REFERENZ DIGITAL 2404

The air-helix construction of the Reference Digital-2404 is wholly unique. We have developed a special clip to ensure air insulation that is as close to perfection as possible. A large number of these clips form the supporting structure on the inside of the cable. This holds the signal conductor free in the air in a helix form and guides it through the shielding at defined intervals. The flexibility of this construction is attained with two bridges that hold the clips together evenly and at exact intervals. With coaxial cables, the shielding is usually used as an earth conductor. The Reference Digital 2404 RCA on the other hand has a double-symmetric structure and has two positive and two negative conductors. This means that the shielding is completely separate and the signal remains free of interference.

KEY-FEATURES

- AIR HELIX DESIGN
- EXTREMELY LOW CAPACITIES THANKS TO AIR DIELECTRIC
- CROSS LINK SUPER SPEED WAVE GUIDE
- DOUBLESYMMETRICAL DESIGN
- PE-NETWORK JACKET
- RHODIUM-COATED CONTACTS



You can find a summary of the various connection options on page 43.



ADDITIONAL PRODUCT DATA

- Signal-free protective cover
- Braided shield, oxidation protected
- Rhodium-coated contacts
- GAP-RCA II plugs or XLR plugs
- Impedance 75 Ohm (RCA) / 100 Ohm (XLR | AES-EBU)

REFERENZ AC-3500P

The Referenz Power Station AC-3500P reliably suppresses all unwanted interference from the power system. The Active Power Distributor implements a highly efficient parallel filter perfectly attuned to the audiophile's needs. The filter leads off all interference from both the power system and the connected devices themselves without restricting the supply. Add to this the dampened sub chassis that reduces mechanical vibrations of the filter components caused by the 50-Hz grid frequency. In addition, the star-shaped distribution topology ensures uniform supply of all connected units.

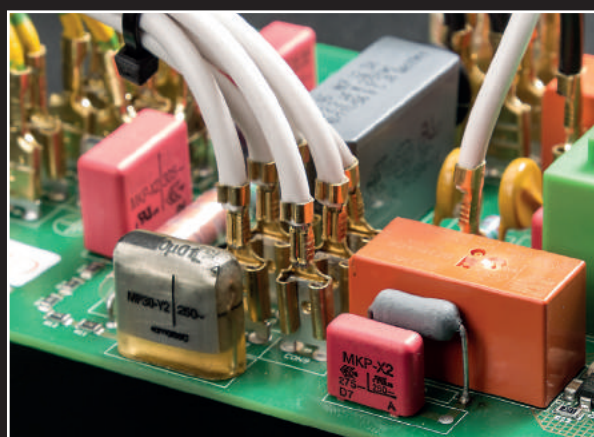
KEY-FEATURES

- HIGHLY EFFICIENT CENTRALIZED PARALLEL FILTER
- DAMPENED SUB CHASSIS
- BALANCED POWER DISTRIBUTION
- HIGH-END SCHUKO SOCKETS
- HIGH-CURRENT POWER INLET (IEC C20)
- OVERVOLTAGE PROTECTION
- SUPPLY VOLTAGE: 100-250V AC / 50-60HZ
- OPERATING CURRENT (MAX.): 16 A
- INPUT POWER (MAX.): 3,680 W (230 VAC, 16 A)
- ALL-POLE DISCONNECTION
- BRUSHED-ALUMINUM FRONT PANEL



HIFI-STARS

„Unbelievable - you hear the difference at first go.
It's really fascinating how much sound is in the mains.“



THE CLEANER

The Referenz Power Station AC-3500P becomes a key factor to a fine yet powerful sound. The technical design is housed in a stout metal enclosure with a front panel of silver or black anodized brushed aluminum. Six high-quality power sockets are available at the rear panel. The centrally placed high-current power inlet (IEC C20) allows for easy replacement of the supply cable – for example, with a longer one. The built-in surge suppressor protects your precious devices from voltage peaks, and you can conveniently switch all power sockets on and off using the power key on the front panel. An indirect LED light located at the front-panel bottom shows the current operational status.



REFERENZ SELECTON





SPEAKER CABLE	LS-4004 AIR PURE Silver	LS-4004 AIR	LS-2404 AIR Pure Silver	LS-2404 AIR
Air Helix Design	x	x	x	x
Low capacities thanks to air dielectric	x	x	x	x
Pure Silver Conductor	x		x	
Cross Link Super Speed Wave Guide	x	x	x	x
Super Speed Wave Guide				
High Speed Wave Guide				
Double Layer Multicore	x	x	x	x
Multicore	16-fold	16-fold	8-fold	8-fold
PE-Network Jacket	x	x	x	x
Lacquered wires	x	x	x	x
Silver-plated wires				
Number of single conductor	16	16	8	8
Conductor cross-section	16 x 1,2 mm ²	16 x 1,2 mm ²	8 x 1,2 mm ²	8 x 1,2 mm ²
Diameter	44mm	44mm	24 mm	24 mm
High Power Management	x	x	x	x
DUO-PE II Isolation				
Concentric Copper				
Page in catalogue	16	18	20	22

CONNECTIONS

Singlewire	x	x	x	x
Single-BiWire	x	x	x	x
Plugs made of tellurium copper	x	x	x	x (MK II)
Pressure-grouted plugs (1.5 T pressure!)	x	x	x	x (MK II)
BFA adjustable rhodium coated	x	x		x (MK II)
BFA 45° rhodium coated			x	x
BFA rhodium coated			x	x
Spade lug adjustable rhodium coated	x	x		x (MK II)
Spade lug rhodium coated			x	x
Easy Plug			x	x
Screw Type	x	x	x	x
Standard length	2 x 3,0m	2 x 3,0m	2 x 3,0m	2 x 3,0m
Custom-made length	x	x	x	x



LS-1204 AIR	LS-2404	LS-1603 Silver	LS-1603
X			
X			
X			
	X		
		X	X
X			
4-fold	24-fold	16-fold	16-fold
X	X	X	X
X	X		
		X	
8	24	16	16
4 x 1,2 mm ²	24 x 0,74 mm ²	16 x 0,74 mm ²	16 x 0,74 mm ²
14 mm	24 mm	16 mm	16 mm
X	X	X	X
	X	X	X
	X	X	X
23	24	26	26

X	X	X	X
X	X	X	X
X			
X			
	X	X	X
X		X	X
	X	X	X
		X	X
2 x 3,0m	2 x 3,0m	2 x 3,0m	2 x 3,0m
X	X	X	X
			

LS-4004 AIR

„This cable carries a lot of consideration and manual work. The LS-4004 AIR is one of the finest cables we've ever heard. It is gifted with a phenomenal analysis. Moreover it features a lush bass and a great panorama.“

stereoplay | 01-2018

„This cable has what it takes to lift the performance of my chain into the next class! [...] The music flowed effortlessly into my ear and from there coursed right into my stomach. My goodness - that was fun!“

Fidelity 38-2018



LS-4004 AIR

LS-2404 AIR

„It's difficult to describe – you have to experience it yourself. Or to put it in terms of money, a hi-fi combination worth €20,000 can be improved by 20% simply with the LS-2404 AIR. That amounts to an extraordinary value.“

Stereoplay 01-2017



LS-2404 AIR

LS-1204 AIR

„A stroke of genius that also shows the competitors the limits. Processing: outstanding“

AUDIO | 12-2018

„Therefore, the very elaborate hand-crafted cable with an insulation made of air is a real insider tip.“

HiFi Test | 05-2018



LS-1204 AIR

inakustik

REFERENZ
LS-1204 AIR

SPEAKER

SER. NO. 720183





REFERENZ SELECTON

AUDIO PHONO DIGITAL CABLE	NF-2404 AIR	NF-1204 AIR	NF-1603	Phono 2404	Digital 2404
Air Helix Design	x	x		x	x
Low capacities thanks to air dielectric	x	x		x	x
Cross Link Super Speed Wave Guide	x	x		x	x
High Speed signal conductor			x		
Braided shield, oxidation protected	x	x		x	x
Signal-free shielding	x	x	x	x	x
Separate earth cable				x	
PE-Network Jacket	x	x	x	x	x
Construction	symm.	coaxial	3-fold symm.	symm.	dooble symm.
PE-Tube support			16-fold		
DUO-PE II insulation			x		
GAP II shielding			x		
Diameter	24 mm	14 mm	11 mm	24 mm	24 mm
Impedance					750hm /1000hm
Page in catalogue	32	34	35	36	38

ANSCHLUSSVARIANTEN

RCA -> RCA rhodium coated	x	x	x	x	x (75 Ohm)
XLR -> XLR rhodium coated	x	x	x		x (110 Ohm)
SME 90° -> RCA rhodium coated				x	
SME -> RCA rhodium coated				x	
SME 90° -> XLR rhodium coated				x	
SME -> XLR rhodium coated				x	
Standard length	0,75 1,0 1,5	0,75 1,0 1,5	0,75 1,0 1,5	1,0 1,5 2,0	1,0 1,5 2,0
Pressure-grouted plugs (1.5 T pressure!)		x			
Hermetic ground connection		x			
Custom-made length	x	x	x	x	x





REFERENZ SOUND EDITION

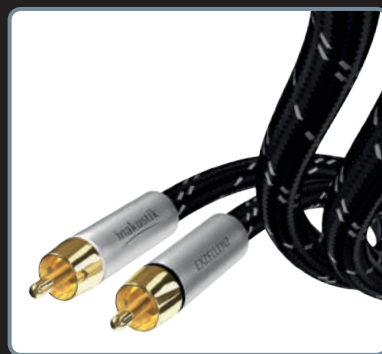
The samplers of our Reference Sound Edition have been assembled with a love of musical detail. RESO Mastering (Reference Sound Mastering), the high definition mastering procedure, provides significant acoustic improvements in transparency, dynamics, bass reproduction and depth differentiation. The music is gaining more atmosphere and emotion. To best transmit this musical experience, instead of a normal CD, a HQCD respectively to get even closer to the master quality, a U-HQCD is used as sound carrier and instead of normal LP vinyl, 180g audiophile Virgin Vinyl.



ITEM-NO	TITEL	MEDIUM
01675015	Reference Sound Edition – Great Voices Vol.1	U-HQCD
0167501	Reference Sound Edition – Great Voices Vol.1	HQCD
01675011	Reference Sound Edition – Great Voices Vol.1	Audiophile Double LP
0167502	Reference Sound Edition – Great Voices Vol.2	HQCD
01675021	Reference Sound Edition – Great Voices Vol.2	Audiophile Double LP
0167503	Reference Sound Edition – Great Cover Versions	HQCD
01675031	Reference Sound Edition – Great Cover Versions	Audiophile Double LP
0167504	Reference Sound Edition – Great Guitar Tunes	HQCD
01675041	Reference Sound Edition – Great Guitar Tunes	Audiophile Double LP
0167505	Reference Sound Edition – Soundcheck	HQCD
01675051	Reference Sound Edition – Soundcheck	Audiophile Double LP
0167506	Reference Sound Edition – Great Women Of Song	HQCD
01675061	Reference Sound Edition – Great Women Of Song	Audiophile Double LP
0167507	Reference Sound Edition – Great Men Of Song	HQCD
01675071	Reference Sound Edition – Great Men Of Song	Audiophile Double LP
01675085	Reference Sound Edition – Great Voices Vol.2	U-HQCD
0167508	Reference Sound Edition – Great Voices Vol.2	HQCD
01675081	Reference Sound Edition – Great Voices Vol.2	Audiophile Double LP



in-akustik headquarters in Ballrechten-Dottingen





IN - AKUSTIK

THER`S MORE BEHIND IT

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A pure sound, a sharp image and an exclusive feeling of luxury - this is our aim as a company: the best quality for the eyes and ears –for the senses. We have been committed to perfection since 1977 – in sound, picture, music & media and exclusive designs. To achieve this, we have laid our focus on in-house product development and the manufacturing of our top quality cables in Ballrechten- Dottingen. Part of this is our exceptional attention to detail – whether this involves the complex cable structures, the stylish spatial concept of AmbienTech or the selection of artists for our own music label. It is this emphasis on the fundamental aspects which has made in-akustik so strong and helped us become a globally active company with international ambition with a hugely impressive product range.

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We are member of the
 HIGH END SOCIETY