Choosing the right coil wire

The sound characteristics of a coil are not only determined by the coil core (see p. 32) and the manufacturing quality but also by the wire type used. In order to be able to offer you the right coil for each application we use **three types of wires** made of **three materials** of highest purity.

OFC copper

Coils that use oxygen-free copper (99.997% purity) as conductor material are characterised by a harmonic, stereophonic reproduction of music, rich in detail, and an excellent price/performance ratio.

Pure silver

Due to their ability to reproduce voices and instruments in a more dynamic, detailed, spatial manner and with more timbres compared to copper coils, silver coils of highest purity (type 99.99%) are highly appreciated and preferred by a number of audio enthusiasts.

SilverGold

99% silver + 1% gold = 100% music.
This does not only add up for capacitors such as the MCap® SUPREME SilverGold.Oil and audio cables, but also for coils. The high-purity gold (type 99.99%) changes the crystalline structure of silver and maximises its very good electric conductivity. Instruments and voices unfold their full range of timbres and their character is illuminated and becomes perceivable in all shades. On the one hand `crystal clear,´ the reproduction is at the same time vibrant and warm, embedded in a finely differentiated, location-true image. Purity and fine elegance combined with a vibrant character distinguish this exquisite material from all others!

SolidCore wires

The reproduction of music by coils made of **solid round wires** (also referred to as SolidCore) excels by natural vibrancy and fineness as well as highest tonal neutrality. Another benefit of round wire coils are their highly compact dimensions. Like all Mundorf coils, they are wound and mounted by hand with highest accuracy and precision using special machines in Germany.

OFC standard is the most cost-efficient, audio-compatible coil wire and available in diameters from 0.50 to 3.90mm. Coils made of this material, however, do not have an additional coil fixation and thus have a disadvantage with respect to sound compared to all other coil types manufactured by Mundorf: This is because electric current passing through a coil will always cause a vibration of the entire winding. Due to the microphonic effect (the conversion of mechanical oscillations to electric oscillations) these mechanical oscillations are added to the original signal as additional information. This results in an interference with and an alienation of the details of the original signal. On the one hand, this results in a loss of spatial quality and transparency of the music and on the other hand in an increase of distortions and tonal discolorations of the signal. This physically induced unwanted effect, however, can be eliminated completely by the use of baked varnish wire or by means of vacuum impregnation.

Baked varnish coils have a special, solid OFC round wire with an additional layer of varnish. After the coil has been wound, it is heated up by means of an electric impulse causing the additional layer to melt. When cooling down, the individual windings are firmly bonded together by the baked varnish and are thus prevented from vibrating and the original signal remains uncorrupted. Unfortunately, self-bonding wires are only available in diameters from 0.50 to 1.40mm.
Vacuum impregnation is another procedure, equally effective as heat bonding, which we offer for coils with larger wire diameters (2.00 to 3.90mm). In vacuum impregnation, the coil is first impregnated with a special lacquer up to the innermost windings under vacuum. Subsequently, the impregnated coil is dried at 130° Celsius. Thus the whole coil is baked into a very solid unit.

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Hepta strand

The use of a strand of **seven individually isolated OFC self-bonding wires** gives the reproduction of music a fine, smooth, harmonic character, which is rich in detail at the same time. These acoustic characteristics are praised and appreciated by our customers, in particular when it comes to the musical `cultivation´ of speaker chassis with a tendency to tonal sharpness or hardness without having a negative impact on qualities such as brilliance and richness in detail.
The character is mainly formed by the use of round wires as single conductors and their special stranding. The baked winding and the reinforced PA coil body together form a winding unit of **highest mechanical stability** and tranquillity. Distortions and discolorations of the music signal are thus largely eliminated. In addition, the large surface of the seven-fold strand improves the effective conductivity for higher-frequent AC (skin effect). Our 7 x 0.6mm strand corresponds to a round wire diameter of approx. 1.60mm.

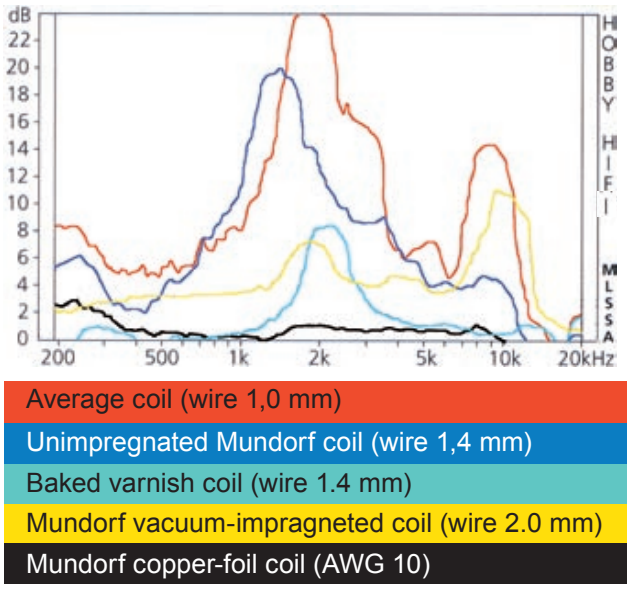
Foil coils

The reproduction of music by coils made of **solid metal foil** (also referred to as ribbon coils) excels by extraordinary dynamics, unparalleled detail and holographic spatial quality and lowest distortions and discolorations - Even finest nuances are represented in a realistic manner. Mundorf foil coils have thus become an integral part of many top-class audiophile products.

With its individual coils wound on each other, the foil coil corresponds to the **physically ideal coil** more than any other design. This is for example reflected in the quality of the coil which remains constant up to beyond 100 kilohertz. Furthermore, these coils are particularly **low-capacitive**, even though the similarity to a wound capacitor suggests the opposite so that even very high frequencies are isolated effectively. In addition, the large surface of the metal film improves the effective conductivity for higher-frequency alternating current (skin effect).

Another remarkable feature is the **high mechanical stability** of these coil types, which are carefully baked by hand: Due to the **large contact surface** between the individual windings and the viscoplastic isolation of the polypropylene foil the oscillations of the individual windings are eliminated effectively. These advantages can be seen clearly in the diagram shown below: Foil coils have the **lowest measured vibrations**. We offer copper foils in widths corresponding to round wire diameters of approx. 1.25mm • 1.60mm • 2.00mm and 2.50mm.

Vibrations of coils



Choosing the right coil core

The sound characteristics of a coil are not only determined by the coil wire (see p. 30) and the manufacturing quality but also by the coil core used. As the use of different cores results in coils with different advantages and disadvantages we offer **four core materials** and a total of seven core types. This enables us to manufacture exactly the right coil for each application.

In order to avoid microphonic effects, all Mundorf coils are wound on a coil body. This ensures mechanical stabilisation of the winding, decoupling of the coil from the board and, in addition, facilitates the manufacturing process.

Air coils

The ideal core material for coils is air. Air cored coils are, for physical reasons, superior to all metal core coils as far as accurate pulse reproduction and freedom from distortion are concerned. They can be used in all areas; either as highpass filter in the middle frequency range, as bass coil (with large conductor cross section) or in correcting components (with thin wire cross section).

Precision, dynamic, subtle tonal gradations, great detail and liveliness distinguish coils with air core from all others. In high-quality speakers, they are thus the basis for realistic and harmonic musical enjoyment. (from p. 33)

Core coils

Core coils have a metal core which reinforces the magnetic field. Compared to air coils, smaller, cheaper coils with higher inductivity and lower ohmic resistance can be realised. However, the metal core also affects the music signal (among other things due to unwanted distortions).

Ferrite cores are sintered from a metal plastic powder. The German-made ferrite material HP3616 used by us offers a significantly higher performance than the Asian cores used in many other products. It is characterised by low basic distortions and rapid magnetic reversibility (= change of field direction). The music signal is hardly delayed so that coils with ferrite cores are perfect for use in correcting components (as so-called peaking coils) and in the middle frequency range.
So far the only ferrite material tested by us HP3616 meets our high demands regarding resilience and distortion making it suitable even for use in the middle-low frequency and bass range for lower amplifier performance. (from p. 41)

Aronit cores (also known as P cores) consist of high-density metal-ceramics-powder. The German-made Wicon ferrite rods produce extremely low distortion, even at very high loadings. Due to their highly compact dimensions, their low internal resistance and their excellent price/performance ratio they are particularly suitable as bass and subwoofer coils and for PA applications. (from p. 44)

Feron cores consist of an iron-silicon alloy (also called electrical sheets). Our high-performance transformer plates are rolled and tampered several times using special procedures so that all crystals are oriented in the same direction (grain oriented) and a uniform crystal-lattice structure is obtained. Mundorf Feron core coils thus differ from conventional, similar looking coils in a measurable and audible way.
They stand out due to minimum basic distortion, magnetic reversal losses and distortions while having a high performance and are thus suitable for flexible applications. (from p. 46)

Zero ohm coils (ZOC) are a speciality of our company. In the ZOC, an air gap is calibrated and precisely adjusted by hand between two sheet metal packages made of Feron. The air gap determines the inductivity of the coil and demands great care in the manufacturing process. The high production costs of the ZOC are always justified when maximum faithfulness in pulse reproduction of the playback is required. This special form of the Feron core coil helps to realise lower internal resistances as compared to other core types. (from p. 48)