

You can find our current retail price recommendations on our website. On request, we will be happy to provide the prices for industry and trade that are valid for you.

Design & Layout	Konrad Schaedle, Arrangé - Büro für Grafik/Design, Cologne
Texts & Tables	Mirko Filke
Photography	Norbert Mundorf
Edited 24.10.2024	Holger Kuban



RoHS compliant (lead-free)
REACH compliant



We purchase clean eco-power since 2008.



We use recycled paper only.

Mundorf EB GmbH
Liebigstr. 110 • 50823
Cologne • Germany

Phone +49 221 977705-0
Fax +49 221 977705-99

Website www.mundorf.com
Email info@mundorf.com

Note: the technical information present was produced with great care. Nevertheless, since errors cannot be ruled out, we would like to point out that Mundorf EB GmbH does not guarantee the information or take legal responsibility or liability for possible consequences that can be attributed to incorrect information.

© Copyright Mundorf EB GmbH 2020
All rights of reprint, of photomechanical reproduction or translation, including excerpts, reserved.

Subject to technical changes by us at any time.

Fidelity Components

Page

Audio Capacitors

General explanations	5
Choosing the optimal Capacitor	6



MCap EVO	9
MCap EVO Oil	9
MCap SUPREME EVO	10
MCap SUPREME EVO Oil	10
MCap EVO SilverGold Oil	11
MCap SUPREME EVO SilverGold	11
Cap SUPREME EVO SilverGold.Oil	12



MCap Classic	13
MCap SUPREME Classic Silver Oil	14
MCap SUPREME Classic SilverGold	15
MCap SUPREME Classic SilverGold Oil	16
MCap ZN Classic	17



ECap AC raw	18
-------------	----

Power Capacitors



Mlytic AG	Audio Grade	19
Mlytic HV	High Voltage	21
Mlytic HC	High Current	23
Mlytic AG +	Filter Capacitor	25
TubeCap®	Power Film Capacitor	27
Car Audio	Power Capacitor	28

Coils / Inductors



Choosing the right coil wire	29
Choosing the right coil core	30

Air Coils



MCoil L	OFC Round Wire	32
MCoil BL	Baked Varnish	32
MCoil VL	Resin Soaked	32
MCoil LL	Hepta Strand	35
MCoil CFC	Copper Foil	36
MCoil SFC	Silver Foil	38
MCoil SGFC	SilverGold Foil	38



FERRITE / ARONIT PipeCore




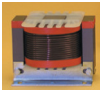







MCoil P	OFC Round Wire	32
MCoil BP	Baked Varnish	32

FERRITE / ARONIT Drum Core



MCoil H	OFC Round Wire	41
MCoil BH	Baked Varnish	41

Fidelity Components

		Page	
	FERON iCore		
	MCoil BS	Baked Varnish 43	
	MCoil CFS	Copper Foil 44	
	FERON Zero-Ohm		
	MCoil N	OFC round wire 45	
	MCoil BN	Baked Varnish 46	
	MCoil VN	Resin Soaked 49	
	MCoil CFN	Copper Foil 49	
	FERON Transformer Core		
	MCoil T	OFC round wire 48	
	MCoil BT	Baked Varnish 48	
	MCoil VT	Resin Soaked 49	
	MCoil CFT	Copper Foil 49	
	Resistors		
	MResist High-Load	50	
	MResist MOX	50	
	MResist SUPREME	51	
	Solders		
	MSolder SilverGold	for Components 52	
	Solder SilverGold	for Cables 52	
	Damping Materials		
	Silence Twaron [®] Unicorn's Tail	53	
	Silence Twaron [®] Angel Hair	54	
	Audio Cable - Accessories		
	MConnect CUW Copper Wires	55	
	MConnect SGW SilverGold Wires	56	
		MConnect BPG Banana Plugs	57
		MConnect CLG Cable Lugs	57
		MConstruct Blade Receptacles	57
	Terminals		
	Terminal Posts	58	
Additional Services			
Further MUNDORF Product Groups		62	

Capacitors

Capacitors (Latin term: condensus = compressor) are capacitive, i.e. they store electric charge. The physical unit of measure for capacity [C] (Latin term: capacitas = capacity) is Farad [F] (in honour of the English physicist and chemist Michael Faraday). Capacitors consist of two electrodes (surfaces conducting electricity) which are arranged close to each other, and a dielectric (insulating layer) in between.

Capacitors (abbr. cap) are frequency-dependent resistors. This is an important property for audio applications because capacitors can filter out low frequencies (i.e. low tones) from music signals. As the filter effect decreases with increasing frequency, the reverse conclusion is: The lower the capacity, the higher the filter effect (i.e. the higher the separating frequency).

Coils

Coils (also referred to as inductors) are inductive, i.e. they influence the current flowing through them by their own magnetic field. The physical unit of measure for inductivity [L] (Latin term: inductio = induce) is Henry [H] (in honour of the US-American physicist Joseph Henry). Coils consist of a wire wound around a core (ideally air).

Similar to capacitors, coils are frequency-dependent resistors. Their filter effect increases with increasing frequency allowing for the elimination of high frequencies (= high tones), i.e. the higher the inductivity, the lower the separating frequency.

Resistors

Resistors (R) (Latin term: resistere = to resist) reduce the current flowing through them by converting part of the energy into heat. The physical unit of measure indicating electric resistance is $[\Omega]$ (according to the German physicist Georg Simon Ohm).

The effect which is important for audio applications is that resistors attenuate the entire audio signal irrespective of the frequency. The higher the resistance value, the more energy is converted.

Stereophony

Lowest tolerances of components used in the left and right signal path are fundamental for realistic and stereophonic (Greek stereos = spatial) music reproduction. Only if the characteristics of both channels are close to identical, each musician can be exactly allocated and an according spatial reproduction is possible.

Richness of detail

The conversion of mechanical into electrical vibrations is referred to as microphonic effect. This effect results in vibrations added to the electric music signal thus overlaying and alienating it. On the one hand, the transparency and stereophony of reproduction decreases, and on the other hand, distortions and tonal irritations increase significantly. Therefore, mechanically solid and vibration-damping components are a vital prerequisite for audiophile music reproduction.

Raw materials & processing

Lowest tolerances and highest mechanical stability can only be guaranteed by using raw materials of highest quality and pureness, maximum accuracy regarding to controls as well as utmost precision and continuity in production. Furthermore, these characteristics which apply for all products made by MUNDORF ensure highest audio pleasure.

Dielectric and constructive structure - in addition to the electrode used (see the following section: Conductor Materials) - are crucial to the sound characteristics of a capacitor. In order to offer you the optimal capacitor for each application, we use alternative insulation materials in different - some self-developed - patented winding processes.

1.0 Electrolytic Capacitors

Aluminium oxide (Al₂O₃) forms the dielectric in all our electrolytic capacitors. It is also called clay or electrocorundum and is sometimes found as a natural mineral whose crystals are known to us as ruby or sapphire. Al₂O₃ is an extremely hard and resistant insulator with high heat conductivity. In particular, aluminium oxide is characterised by very high dielectric strength and ultra-thin layer thickness and thus allows the manufacture of extremely compact capacitors with an excellent price/performance ratio.

1.1 Polarised Electrolytic Capacitors possess the most compact of structural forms and are therefore used at very high capacities, as required for example, in the voltage supply of amplifiers. However, since they are not AC voltage-proof, polarised electrolytic capacitors cannot transmit audio signals.

1.1.1 Mlytic® Power Capacitors have a whole range of special features, all of which serve one purpose: the most authentic music playback possible. A basic requirement for achieving this aim is to minimise the undesired losses (ESR) and inductivities (ESL) occurring in the capacitor that impact negatively on the original signal. The use of high-purity materials for the anode foil and the highest production precision ensure a homogeneous etching structure of the crystalline Al₂O₃ layer, the actual basis for detailed music playback with balanced sound character. The use of a special, titanium-coated cathode foil allows capacitors with unusually low ESR values characterised by 'holographic' spatial music playback with broad and deep on-stage representation and absolutely stable focus.

Between these two foils we combine highly flowable, chloride-free and largely water-free longlife electrolytes with extremely soft special paper (mostly abaca-esparto paper) that is characterized by high mechanical stability, outstanding internal damping and electrolyte absorption capacity. Moreover, we do not use magnetisable, inflexible, poorly conducting steel for the connectors (global snap-in standard); instead we exclusively use highly conductive tin-plated copper wires for the highest currents, alongside the familiar, multiple-contact, solid aluminium screw terminals.

1.1.2 Mlytic+® 4-pole Filter Capacitors also combine this outstanding technology. However, contacting takes place at the start and end of the respective foil. Although these low-current types have a comparatively reduced current capacity, they possess outstanding filter characteristics with again reduced ESR and ESL. The engineering office IB Steinbach (ib.steinbach@netcologne.de) is happy to develop corresponding circuits for and with audio manufacturers.

1.2 Bipolar Electrolytic Capacitors (also called non-polarized or NP) possess a second anode foil that makes them AC voltage-proof and thus music signal-suitable. ECap raw possess foils whose surfaces have been roughened and thus enlarged by means of a special etching process. In contrast, ECap plain are made from unetched and thus lower-loss foils.

2.0 Film Capacitors

Polypropylene (PP) is used as the dielectric in all our film capacitors. As a capacitor film PP is globally the No.1. It is a partially crystalline hydrocarbon that reliably fulfils the highest standards of safety in use, pulse handling capability, AC voltage proofness and dielectric strength. The extreme temperature and frequency stability of PP's ultra-low ESR and capacity value is absolutely unique. This is added to by fantastic mechanical features such as the very equal film thickness for the highest precision in production or the high elasticity and thermal plasticity for ultra stable and vibration-cushioned capacitor winding.

Of course, in the past decades we have regularly conducted comparative listening tests with various alternatives (paper, PTFE, polyester, PEN and polycarbonate). Although these materials were – technically and in terms of sound - equal or even superior in some individual aspects, the overall experience was always nicest and the enjoyment of the music the greatest with PP film capacitors*.

2.1 Film/foil capacitors (KP) are wound as conductors from solid metal foils. The enormous conductivity and the high inertia of the metal foil ensures a minimal loss angle and prevents resonances. This leads to very lively playback. The disadvantages of the high use of material are the costs, an increased failure rate due to the physical load of the dielectric and the lack of self-healing properties (i.e. breakdowns in the insulator lead to full signal passage). We therefore advise against use in electronics and in industrial production!

2.2 Metallised capacitors (MKP) are wound using films with a vacuum-metallised metal layer. This modern structure is more compact, more reliable and more value-for-money than film/foil capacitors and also possesses outstanding self-healing properties (i.e. the metal coat evaporates around damaged spots in the dielectric, thus insulating them).

2.2.1 MCap® EVO are metallised PP film capacitors based on the innovative EVOLUTION winding Technology. Its main feature is its unusually narrow and high capacitor winding. This geometry produces two acoustically clearly perceptible advantages compared to traditional, easier-to-manufacture MKPs. One advantage is that the shortest, low-loss signal routes as well as particularly large contact surfaces are ensured (and thus extremely low residual resistance ESR); the other advantage is that an extremely large number of windings are parallel-connected, minimising inductivity (ESL). In addition, they are moulded by hand according to the highly precise winding process in specially developed, compact housings. This prevents the winding from vibrating and microphony effects on a sustained basis. In the sound pattern, all these special features are perceived through sound-quality liveliness, nuanced, transparent dynamics as well as outstanding authenticity and stereophony.

2.2.2 MCap® SUPREME are metallised PP film capacitors based on the audiophile SUPREME winding technology. The special layout of the capacitor films makes it possible to interlace two interlying, counterwound capacitor windings in such a way that the inductivities of the individual windings almost cancel each other out. The two windings are connected in series; consequently, two windings, each of $2\mu\text{F}$ - i.e. in total material for a $4\mu\text{F}$ conventional structure - are processed to manufacture a $1\mu\text{F}$ SUPREME capacitor. This process - challenging in production technology terms - which has been offered since 1992 demands the greatest care in production, which is, to a large extent, manual. To rule out colouration of the music signal due to microphony, they are mechanically stabilised by hand in an additional process and moulded in special housings. This high degree of effort is absolutely justified by the fascinatingly realistic music experience, with plasticity of the on-stage representation that is fully released by the loudspeaker and is virtually holographic, with crystal-clear contours and outstanding offset in depth.

2.2.3 MCap® SUPREME EVO are the perfect liaison of the two aforementioned Mundorf MKP special structures and were specially developed for and tailored towards the heightened requirements and increased opportunities of the latest generation of loudspeaker chassis. In addition to increased effectiveness, richness of detail and transmission range, these chassis are characterised above all by a previously unknown synthesis of explosive dynamics and distortion-free silkiness. Our new top class fulfils the high standards by combining the stimulatingly authentic verve with the outstandingly three-dimensional spaciousness of EVO and SUPREME in a virtuoso manner to create brilliant, richly faceted, emotionally captivating musicality and pure listening pleasure.

2.2.4 Oil impregnation of metallised PP film capacitors in vacuo is a particular speciality of our company and was used for the first time with MCap® SUPREME Silver.Oil in 2002. In this process, even the smallest air bubbles are squeezed out of the capacitor winding and even the most subtle of hollow spaces are filled and softened with oil. Both electrical and mechanical losses in the capacitor due to vibration are thus reduced to a minimum. Mundorf oil capacitors are characterised by their extremely sophisticated and highly dynamic detail and are superior to their respective dry counterpart in presence, speed and precision.

The conductor material of the electrode - in addition to the insulator and the structural design (see preceding section: Dielectrics & Structures) - is crucial to the sound characteristics of a capacitor. In order to offer you the optimal audio capacitor for different applications and your individual standards with regard to the range and facet richness of tonality, acoustic colours and overtones, we use five conductor materials of the highest cleanliness.

3.1 Zinc as an electrode material is the specialist for the highest dielectric strength and is therefore used by us in capacitors for the voltage supply of audio electronics. Compared to electrolytic capacitors with a similar purpose and a maximum of 500 to 550VDC, with zinc-damped PP film we can produce AC voltage-proof capacitors in the kV range that have significantly fewer losses, an unlimited lifespan and outstanding self-healing properties. However, due to the acoustic properties we advise against use in audio capacitors!

3.2 Tin is characterised by its particular softness and pliability and is therefore outstandingly suitable for use as a metal foil in KP capacitors. The mechanical load of the dielectric and thus the failure rate are minimised as far as possible through the use of tin foil and internal damping is maximised. The incredible dynamics and the richness of detail that result from this structure compensate for the characteristic acoustic disadvantages of this conductor material.

3.3 Copper* harmonises better with paper than with PP film as a dielectric, in our experience, and thus forms the famous exception to the rule. The outstanding conductivity of copper leads to a dynamic and richly detailed sound pattern with outstanding tonality and naturalness in some frequency ranges; this sound pattern, however, lacks brilliance, balance and precision overall.

3.4 Aluminium is the standard and benchmark in the construction of capacitors, due to its having the highest conductivity of all non-precious metals with respect to weight and its outstanding price/performance ratio. Aluminium MKPs are characterised by richly detailed, lively and harmonious music playback. It is simply indispensable for the manufacture of aluminium electrolytic capacitors on whose anode electrode the dielectric Al_2O_3 is formed (also called anodic oxidation).

3.5 Silver of the highest cleanliness (typically 99.99%) is highly valued and preferred by many audio enthusiasts as a conductor material due to its outstanding ability to reproduce voices and instruments even more dynamically, with greater richness of detail and with more acoustic colours.

3.6 SilverGold 99% silver + 1% gold = 100% music. The use of this conductor material can be condensed into this simple formula. The ultrapure Gold (typically 99.99%) changes the crystalline structure of silver and maximises its very good electrical conductivity. Instruments and voices unfurl their whole range of lively acoustic colours and their character is illuminated and becomes experiential in all nuances. ‚Crystal clear‘ on the one hand, the playback is lively and warm at the same time, embedded into a delicately differentiated picture and steeped in musical beauty. Delicate elegance, tonal purity and its lively dynamics make this exquisite material stand out from all others!



The **MCap® EVO** was designed in 2012 as the successor of the RXF to facilitate utmost musical enjoyment even in small spaces on a limited budget. The PP capacitor film used here is first metallised with the thickest possible aluminium layer, then wound precisely into innovative EVO-LUTION winding geometry and then potted by hand into special casings.



These features are reflected in the music playback with colorful liveliness, remarkable micro dynamic alongside enhanced transparency, authenticity and stereophony. In addition, the **MCap® EVO** is characterised by low tolerances, compact dimensions, low costs and the highest standards of safety in use (self-healing).

Its asymmetrical leads make it possible to assemble it in a classic, horizontal style or vertical.

You will find extensive information about the technologies used on pages 6 to 8 in sections [2.0](#) • [2.2](#) • [2.2.1](#) • [3.4](#).

Thanks to its [2.2.4 Oil impregnation](#), the **MCap® EVO Oil** offers further developed dynamics. Its additional wrapping as well as its imprint in red-metallic impart an appropriate quality look and haptic.

ME

MCap EVO

Capacity [µF]	VDC	Body Ø* L [mm]	Wire Ø* E/A [mm]
0,010 ±5%	650	12 * 12	0,6 * 35/35
0,10 ±5%	650	12 * 12	0,6 * 35/35
0,15 ±5%	450	16 * 14	0,8 * 35/50
0,22 ±4%	450	16 * 14	0,8 * 35/50
0,27 ±4%	450	18 * 14	0,8 * 35/50
0,33 ±3%	450	18 * 14	0,8 * 35/50
0,39 ±3%	450	20 * 14	0,8 * 35/50
0,47 ±3%	450	20 * 14	0,8 * 35/50
0,56 ±3%	450	22 * 16	0,8 * 35/50
0,68 ±3%	450	22 * 16	0,8 * 35/50
0,82 ±3%	450	25 * 16	0,8 * 35/50
1,00 ±3%	450	25 * 16	0,8 * 35/50
1,50 ±3%	450	30 * 16	0,8 * 35/50
1,80 ±3%	450	25 * 21	0,8 * 35/50
2,20 ±3%	450	25 * 21	0,8 * 35/50
2,70 ±3%	450	30 * 21	0,8 * 35/50
3,30 ±3%	450	30 * 21	0,8 * 35/50
3,90 ±3%	450	25 * 27	0,8 * 35/50
4,70 ±3%	450	30 * 27	1,0 * 35/60
5,60 ±3%	450	30 * 27	1,0 * 35/60
6,80 ±3%	450	35 * 27	1,0 * 35/60
8,20 ±3%	450	35 * 27	1,0 * 35/60
10 ±3%	450	40 * 27	1,0 * 35/60
12 ±3%	450	35 * 35	1,0 * 35/65
15 ±3%	450	40 * 35	1,0 * 35/75
18 ±3%	450	50 * 35	1,0 * 35/75
22 ±3%	450	50 * 35	1,0 * 35/75
33 ±3%	450	65 * 35	1,2 * 35/90
47 ±3%	350	50 * 50	1,2 * 35/90
56 ±3%	350	65 * 50	1,4 * 50/105
68 ±3%	350	65 * 50	1,4 * 50/105
82 ±3%	350	75 * 50	1,4 * 50/105
100 ±3%	350	75 * 50	1,4 * 50/105
150 ±3%	250	50 * 90	1,4 * 50/140
220 ±3%	250	65 * 90	1,4 * 50/140
270 ±3%	250	65 * 90	1,4 * 50/140
330 ±3%	250	75 * 90	1,4 * 50/140

General Information:

Dielectric: Polypropylene (PP)

Metallisation: Aluminium

tan δ: = 0.0002@1kHz · 0.0001@10kHz

Max. ambient temperature: 85°C/185°F

Highly recommended for new designs.

Further voltages, capacities and custom labeling are available on request.

MEO

MCap EVO Oil

Capacity [µF]	VDC	Body Ø* L [mm]	Wire Ø* E/A [mm]
0,010 ±5%	650	12 * 12	0,6 * 35/35
0,10 ±5%	650	12 * 12	0,6 * 35/35
0,15 ±5%	450	16 * 14	0,8 * 35/50
0,22 ±4%	450	16 * 14	0,8 * 35/50
0,33 ±3%	450	18 * 14	0,8 * 35/50
0,47 ±3%	450	20 * 14	0,8 * 35/50
0,68 ±3%	450	22 * 16	0,8 * 35/50
1,00 ±3%	450	25 * 16	0,8 * 35/50
1,50 ±3%	450	30 * 16	0,8 * 35/50
1,80 ±3%	450	25 * 21	0,8 * 35/50
2,20 ±3%	450	25 * 21	0,8 * 35/50
2,70 ±3%	450	30 * 21	0,8 * 35/50
3,30 ±3%	450	30 * 21	0,8 * 35/50
3,90 ±3%	450	25 * 27	0,8 * 35/50
4,70 ±3%	450	30 * 27	1,0 * 35/60
5,60 ±3%	450	30 * 27	1,0 * 35/60
6,80 ±3%	450	35 * 27	1,0 * 35/60
8,20 ±3%	450	35 * 27	1,0 * 35/60
10 ±3%	450	40 * 27	1,0 * 35/60
15 ±3%	450	40 * 35	1,0 * 35/75
18 ±3%	450	50 * 35	1,0 * 35/75
22 ±3%	450	50 * 35	1,0 * 35/75
27 ±3%	450	65 * 35	1,2 * 35/90
33 ±3%	450	65 * 35	1,2 * 35/90
39 ±3%	350	50 * 50	1,2 * 35/90
47 ±3%	350	50 * 50	1,2 * 35/90
56 ±3%	350	65 * 50	1,4 * 50/105
68 ±3%	350	65 * 50	1,4 * 50/105
100 ±3%	350	75 * 50	1,4 * 50/105
150 ±3%	250	50 * 90	1,4 * 50/140
220 ±3%	250	65 * 90	1,4 * 50/140