



## Fidelity Components ECap



Aluminium electrolytic capacitors are used in applications for which film capacitors are not suitable for reason of space and/or cost. Polarised electrolytic capacitors which have the most compact design and are therefore used for very high capacities (e.g. for the voltage supply of amplifiers) cannot transfer any audio signal because audio signals are AC signals.

Bipolar electrolytic capacitors such as the ECap AC series have a second aluminium foil providing AC voltage resistance and thus making them suitable for music signals. Further special features of all **ECap AC capacitors**:

Variety of applications	Special designs are available within only 4-6 weeks and already from a quantity of 144 items RoHS-compliant · lead-free REACH-compliant All ingredients are UL listed Specifications according to DIN 41332 · IEC 60384-4 Thermal tests according to IEC 60068 40/105/56	
Guarantee of origin	Manufactured in Germany	

The bipolar electrolytic capacitors of the **ECap AC · Audio Coupling & Signal Cap RAW** series have foils with surfaces which are roughened by a special etching process thus enlarging the surface. As the capacity of capacitors is proportional to their surface, this process provides the smallest and cheapest Mundorf audio capacitors. Additional special features:

Capacity range	1µF to 800µF
Electric strength	AC23 DC63 · AC35 DC100
Temperature range	-40°C/-40°F to 85°C/+185°F
Service life [U <sub>R</sub> · I <sub>R</sub> ~]	3,000 hours at +85°C/+185°F
Loss angle [tan α]	0.050 @ 1kHz



### ECAP100 (formerly br100)

#### Electrolytic capacitors 100 VDC / 35 VAC, raw

Capacity [µF] ±5%	Body Ø * L [mm]	Wire Ø * L [mm]
10	10 * 30	0,8 * 60
15	10 * 30	0,8 * 60
22	12 * 30	0,8 * 60
33	12 * 30	0,8 * 60
47	14 * 37	0,8 * 60
56	14 * 38	0,8 * 60
68	16 * 39	0,8 * 60
82	18 * 39	0,8 * 60
100	18 * 39	0,8 * 60

### ECAP63 (formerly br63)

#### Electrolytic capacitors 63 VDC / 23 VAC, raw

Capacity [µF] ±5%	Body Ø * L [mm]	Wire Ø * L [mm]
150	14 * 37	0,8 * 60
220	16 * 39	0,8 * 60
270	21 * 36	0,8 * 60
330	21 * 36	0,8 * 60
390	25 * 38	0,8 * 60
470	25 * 38	0,8 * 60
680	25 * 38	0,8 * 60

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The bipolar electrolytic capacitors of the **ECap AC · Audio Coupling & Signal Cap PLAIN** series are made of smooth and thus low-loss foils. This has a positive effect on the sound characteristics. Music is reproduced in more details and nuances. Highlights:

Capacity range	1µF to 200µF
Electric strength	AC23 DC35 · AC35 DC50 · AC50 DC70
Temperature range	-40°C/-40°F to 85°C/+185°F
Service life [U <sub>R</sub> · I <sub>R</sub> ]	5,000 hours at +85°C/+185°F
Loss angle [tan α]	0.025 @ 1kHz

### ECAP70 (formerly bg50)

#### Electrolytic capacitors 70 VDC / 50 VAC, plain

Capacity [µF] ±5%	Body Ø * L [mm]	Wire Ø * L [mm]
1.0	10 * 20	0,8 * 60
1.5	10 * 20	0,8 * 60
2.2	10 * 30	0,8 * 60
2.7	10 * 30	0,8 * 60
3.3	10 * 30	0,8 * 60
3.9	10 * 30	0,8 * 60
4.7	10 * 30	0,8 * 60
5.6	12 * 30	0,8 * 60
6.8	12 * 30	0,8 * 60
8.2	14 * 37	0,8 * 60
10	14 * 37	0,8 * 60
15	18 * 39	0,8 * 60
22	25 * 38	0,8 * 60
33	25 * 38	0,8 * 60
47	25 * 49	0,8 * 60

### ECAP50 (formerly bg35)

#### Electrolytic capacitors 50 VDC / 35 VAC, plain

Capacity [µF] ±5%	Body Ø * L [mm]	Wire Ø * L [mm]
47	25 * 38	0,8 * 60
56	25 * 49	0,8 * 60
68	25 * 49	0,8 * 60
82	30 * 50	0,8 * 60
100	30 * 50	0,8 * 60

## About the advantages of MLYtic® technology

The latest generation of electrolytic capacitors features many special properties which all have the same goal: highest possible authenticity in music reproduction. In order to achieve this goal, it is an absolute requirement to minimise the unwanted losses [ESR] and inductivities [ESL] which occur in the capacitor and influence the signal.

Therefore, we took into consideration each and every detail and questioned and reassessed any existing solution. Below are the results of our comprehensive developments.

### Black cathodes

The application of a specific titan-coated cathode foil has impressive effects with regard to measurements and acoustics. The matt black shining titan layer applied in a vacuum replaces the conventional aluminium oxide layer which acts as isolator [dielectric] between the aluminium contact foil and the electrolyte thus forming a second capacitor within the capacitor which influences the overall performance negatively. Thus the black cathode prevents the electrolyte from simultaneously acting as cathode [negative pole] to the anode foil and as anode [positive pole] to the aluminium contact foil.

**MUNDORF electrolyte capacitors** with black cathode thus have a real cathode foil! This foil allows for extremely fast ionic movements almost without any losses thus reducing ESR, distortions and inherent noise to an absolute minimum. The positive effects are comparable to those when using modified electrolytes which are for example produced by adding graphite, however much more distinctive. The result is a holographic music reproduction with wide and deep stereophony and an absolutely tremble-free focus.

### Highly purified anode foil

Utmost precision in production and the use of highly purified materials guarantee a homogenous etching structure as well as a crystalline aluminium oxide layer. As this Al<sub>2</sub>O<sub>3</sub> layer is the dielectric of the capacitor, this balance and precision is a special feature of the acoustic character of the whole capacitor.

### Abacá-Esparto paper

Using esparto grass [also referred to as Alfa grass] and Abacá [also referred to as Manila hemp or Musa textilis] for the capacitor paper allows for both high mechanical stability and extremely soft and open structures. The high self-damping properties of this special paper have a mechanically balancing effect on the capacitor and add a high degree of neutrality to music reproduction.

### Electrolytes

We only use GBL [also referred to as butyro-1.4-lactone and gamma butyrolactone] for capacitors up to 100VDC. In case of higher dielectric strengths, however, we use MEG [also referred to as ethane-1.2-diol or ethylene glycol]. Using these highly purified electrolytes which are free from chloride and almost free from water considerably improves long-time stability and thus product life. At the same time, these electrolytes have a low viscosity [i.e. high flowability] which has a positive impact on electric conductivity. The result is quick and precise music reproduction.

### Joint strength

Due to its large surface, the open structure of the Abacá-Esparto paper has excellent electrolyte absorption properties. In combination with its good formability and the excellent flow properties of the applied electrolytes, it ensures best possible contact between electrolyte and the titan-coated cathode foil. Together they form the highly efficient negative pole of the electrolytic capacitor and allow for smallest dimensions and optimal performance.

### No steel

From now on, steel connectors are a thing of the past at MUNDORF because the use of steel as material for connectors [word-wide standard for snap-ins] has many disadvantages: Among other things, steel connectors cause unwanted eddy currents due to their magnetic properties, have a poor electric conductivity [ $\sigma_{25^\circ\text{C}} 6.2\text{MS/m} = 10.7\% \text{ IACS} = 160\text{m}\Omega\cdot\text{mm}^2/\text{m}$ ] and a low thermal conductivity [ $\lambda_{25^\circ\text{C}} 50\text{W}/(\text{m}\cdot\text{K})$ ]. In addition, the high elasticity [200 GPa] and hardness [7 Mohs] of steel snap-in clamps are a permanent stress for the soldering joint which might reduce the quality of the joint.

### Highly conductive contacts

In addition to the familiar massive screw connections made of aluminium [ $\sigma_{25^\circ\text{C}} 36.5\text{MS/m} = 63\% \text{ IACS} = 27.5\text{m}\Omega\cdot\text{mm}^2/\text{m} \cdot \lambda_{25^\circ\text{C}} 235\text{W}/(\text{m}\cdot\text{K})$ ] for highest currents, all MLYtics® with most compact design have tin-plated copper connections [ $\sigma_{25^\circ\text{C}} 58.0\text{MS/m} = 100\% \text{ IACS} = 17.2\text{m}\Omega\cdot\text{mm}^2/\text{m} \cdot \lambda_{25^\circ\text{C}} 400\text{W}/(\text{m}\cdot\text{K}) \cdot 120 \text{ GPA} \cdot 3 \text{ Mohs}$ ]. For the best possible electrical connection between the individual components, all contacts are securely welded.

All these extraordinary technologies are combined in the **MLytic®** series to provide a minimum of sound leakage and a maximum of fidelity. Capacitors with **MLytic®** technology: the best MUNDORF electrolytic capacitors of all times!