



Together with our suppliers, we develop and produce application-specific cables with cross-sections up to AWG 56 and coaxial cables up to AWG 46. What is barely visible to the eye is nevertheless extremely impressive: important functions such as low noise and highly flexible cable designs are ensured through the use of high-performance materials and special alloys.

MICROCABLES

Properties

Our supply plant develops and produces application-specific cables with cross-sections up to AWG 56 and coaxial cables up to AWG 46. What is barely visible to the eye is nevertheless absolutely impressive: important functions such as low-noise and highly flexible cable designs are ensured by the use of high-performance materials and special alloys. Special shielding guarantees optimum EMC properties. Features such as application-optimized haptics, sterilizability/autoclavability and biocompatibility in accordance with ISO 10993 are guaranteed by the use of state-of-the-art materials. Outstanding areas of use include highly sensitive applications such as minimally invasive surgical techniques and other innovations in medicine and sensor technology. A few examples: An electronic scalpel allows the surgeon to cut tissue in a targeted manner and simultaneously stop any bleeding that occurs. SpO2 sensors can be used to measure oxygen saturation in the blood. Individual micro cable solutions are also a key element in imaging procedures such as magnetic resonance imaging (MRI) or (video) endoscopy. Here and in many other sensitive applications, the quality of these micro products gives users the reassuring feeling of maximum reliability and safety.

Cables for medical technology

The highly sensitive applications in medical technology place special demands on the cable design. The requirements for these cables are: easy handling, autoclavability and reliability.

Cable design, material and production guarantee maximum mechanical flexibility, extreme tensile strength and small size. High-performance materials, special alloys and patented manufacturing techniques also guarantee biocompatibility in accordance with DIN EN ISO 10993 and are used in the following applications, among others:

- Autoclaves/Defibrillators
- Dental technology
- ECG and EEG devices
- Endoscopy

Properties of the insulating materials used								
	Fluoropolymers					Elastomers		Thermoplastic elastomers
	ETFE	FEP	MFA	PFA	PTFE	Silicone	PUR	Santoprene™
Continuous operating temperature (20,000 h)	-100 °C	-100 °C	-100 °C	-190 °C	-190 °C	- 50 °C	- 50 °C	- 50 °C
	+150 °C	+200 °C	+230 °C	+250 °C	+260 °C	+180 °C	+90 °C	+ 105 °C

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Biocompatibility	✓	✓	✓	✓	✓	✓	✓	✓
Resistance to disinfectants	++	++	++	++	++	++	+	+
Halogen-free	x	x	x	x	x	✓	✓	✓
RoHS-compliant	✓	✓	✓	✓	✓	✓	✓	✓
REACH-compliant	✓	✓	✓	✓	✓	✓	✓	✓

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Conductor dimensions

		Diameter		Cross section
AWG	min. (mm)	nom. (mm)	max. (mm)	mm ²
40	0,076	0,079	0,081	0,0049017
42	0,061	0,064	0,066	0,0032170
44	0,048	0,051	0,053	0,0020428
46	0,0384	0,0399	0,0417	0,0012504
48	0,0302	0,0315	0,0328	0,0007793
50	0,0241	0,0251	0,0262	0,0004948

		Diameter		Cross section
51	0,0216	0,0224	0,0234	0,0003941
52	0,0191	0,0198	0,0206	0,0003079
53	0,0170	0,0178	0,0185	0,0002488
54	0,0152	0,0157	0,0165	0,0001936
55	0,0135	0,0140	0,0145	0,0001539
56	0,0119	0,0124	0,0130	0.0001208

Microminiature coaxial cable

The microminiature coaxial cables are constructed with a solid or foamed fluoroplastic dielectric and are particularly suitable for sensors, measurement technology and medical technology.

Item number	AWG	Stranded wire: Number of wires/AWG	Diameter dielectric [mm]	Shielding AWG	Type of shielding	Outer Ø [mm]	Capacity C [pF/m]
Coaxial cable 50 Ohm with PFA fixed							
KOPFA5042U	42	7/50	0,15	44	braided	0,51	143,6
KOPFA5040U	40	7/48	0,20	44	braided	0,56	122,6
KOPFA5038U	38	7/46	0,27	44	braided	0,64	120,3
KOPFA5038G	38	7/46	0,22	44	braided	0,69	113,8
KOPFA5036U	36	7/44	0,35	44	braided	0,71	120,0
KOPFA5036G	36	7/44	0,33	44	braided	0,79	105,2
KOPFA5034U	34	7/42	0,45	44	braided	0,81	114,3
KOPFA5034G	34	7/42	0,45	44	braided	0,91	100,6
Coaxial cable 75 Ohm with PFA fixed							
KOPFA7542U	42	7/50	0,28	44	braided	0,69	81,0
KOPFA7542G	42	7/50	0,20	44	braided	0,71	80,3
KOPFA7540U	40	7/48	0,38	44	braided	0,79	74,0
KOPFA7540G	40	7/48	0,33	44	braided	0,84	72,1
KOPFA7538U	38	7/46	0,46	44	braided	0,87	77,2
KOPFA7538G	38	7/46	0,48	44	braided	0,99	68,4
KOPFA7536U	36	7/44	0,68	44	braided	1,09	69,9

Item number	AWG	Stranded wire: Number of wires/AWG	Diameter dielectric [mm]	Shielding AWG	Type of shielding	Outer Ø [mm]	Capacity C [pF/m]
KOPFA7536G	36	7/44	0,66	44	braided	1,17	67,5
KOPFA7534U	34	7/42	0,89	44	braided	1,29	68,5
KOPFA7534G	34	7/42	0,89	44	braided	1,40	65,7
Coaxial cable 50 Ohm with PFA fixed							
KOPFA5032U	32	19/44	0,68	40	braided	1,19	105,0
KOPFA5032G	32	19/44	0,68	40	braided	1,29	100,0
KOPFA5030U	30	19/42	0,79	40	braided	1,29	110,0
KOPFA5030G	30	19/42	0,79	40	braided	1,45	98,4
KOPFA5028U	28	19/40	1,02	40	braided	1,52	106,2
KOPFA5028G	28	19/40	1,02	40	braided	1,68	98,4
KOPFA5026U	26	19/38	1,30	40	braided	1,80	107,2
KOPFA5026G	26	19/36	1,35	40	braided	2,01	97,0
KOPFA5024U	24	19/36	1,60	40	braided	2,11	110,0
KOPFA5024G	24	19/36	1,73	40	braided	2,39	97,2

All coaxial cables are specified and tested at 10 MHz and for capacitance at 1 kHz. These coaxial cables can also be manufactured from various combinations of conductor material, dielectric and outer insulation according to customer requirements.

Properties of foamed dielectrics

Foamed dielectrics trap a lot of air bubbles and their behavior is therefore similar to that of air dielectrics, whose group delay almost corresponds to the speed of light.

Properties of materials

Material	-B04	-B05	-GX20	-GX16
Temperatur range	80° C	80° C	120° C	200° C
Group time constant	1,80	1,60	1,60	1,45
Dielectric constant	74,5 %	79,0 %	79,0 %	82,5 %

