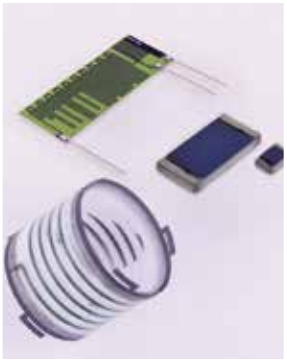
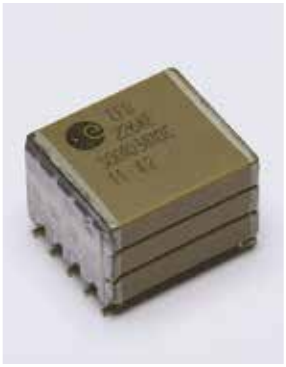
PRODUCTS
& Solutions

November 2022




EXXELIA

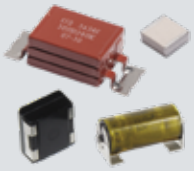
INDUSTRY SPECIALIST

EXXELIA is a manufacturer of High-Rel passive components and precision subsystems focusing on demanding end-markets and applications, intended to critical functions.

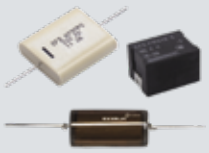
EXXELIA is valued for its ability to meet complex specifications and develop catalog and custom products complying with the most demanding qualification standards (MIL, ESA...).

COMPLETE HIGH-REL COMPONENTS PORTFOLIO

CAPACITORS



Ceramic & Tantalum Capacitors



Film, MML™ & Mica Capacitors

Electrolytic Capacitors

Materials & FTC

MAGNETICS

Toroids

Motors

Transformers Inductors

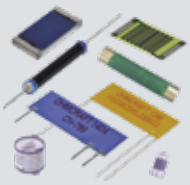
Selfs

RESISTORS & SUBSYSTEMS

Position Sensors, Slip Rings & Rotary Joints

Precision Mechanics

EMI-RFI & EMC Filters



Resistors & Micropen® Printing

DEMANDING MARKETS

Civil aviation

Space

Defense

Transport & Energy

Telecom

Medical

Industry

Test & Measurement

EXXELIA AT A GLANCE

+2100 Employees

12 Manufacturing Locations

ISO 9001
EN 9100
AS 9100
Certified

In more than **30 countries**

1 Stop Shop

EXXELIA WORLDWIDE

EXXELIA is a global company with manufacturing sites strategically located to cover all continents. Four assembly plants are established in competitive manufacturing countries, enabling the group to provide cost-effective solutions.

Thanks to an extensive sales network covering more than 30 countries, **EXXELIA** is able to provide prompt in-depth technical expertise throughout a project and remain close to its clients at all stages from design to production.

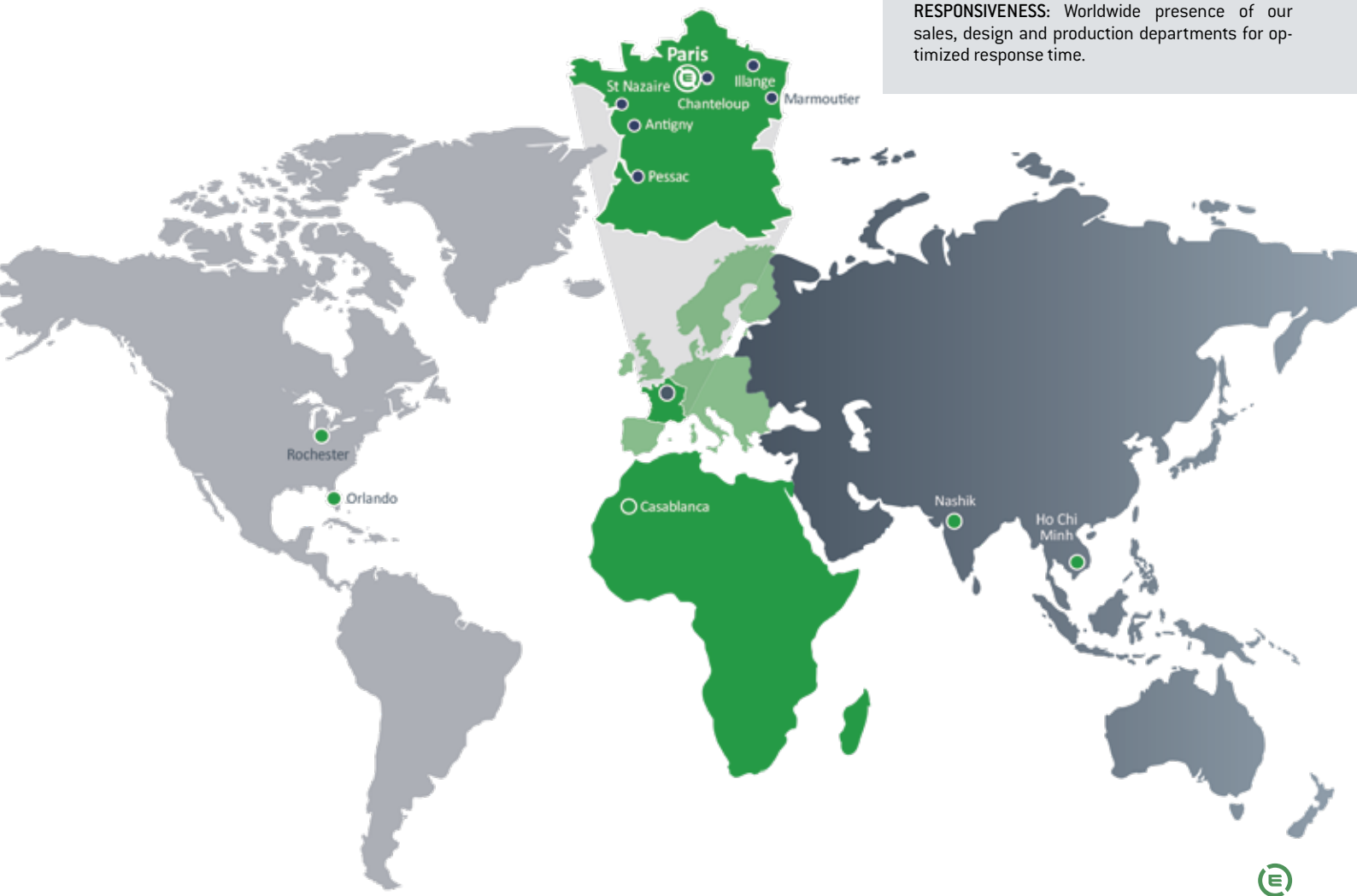
OUR APPROACH

EXXELIA focuses its know-how on challenging markets that require high level of technicality and reliability. Our approach is based on three key principles:

FOCUS: Serving a limited number of defined markets to better serve our customers.

INNOVATION: Provide new and creative value propositions to positively impact our customers' growth.

RESPONSIVENESS: Worldwide presence of our sales, design and production departments for optimized response time.



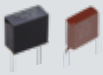
CERAMIC CAPACITORS

EXXELIA multi-layer ceramic capacitors offer excellent temperature resistance, high volume/capacitance ratio, and high reliability. With over 50 years experience, **EXXELIA** has acquired a comprehensive knowledge of the materials properties and performances enabling the company offer porcelain, NP0, BX, 2C1, X7R, C4xx and –2200 ppm/°C dielectrics.

Their excellent properties make **EXXELIA** MLCCs ideal for a wide range of applications including aircraft flight controls, switch-mode power supply in harsh environments, charge/discharge applications, medical implants, drilling tools for oil exploration and satellite platforms.

EXXELIA offers one of the most extensive ESA QPL portfolio and is embedded into numerous space programs (exploration, satellites, constellations, launchers). For requirements that cannot be met by catalog products, **EXXELIA** offers state-of-the-art custom designs in terms of compactness, packaging and performance.

T°	Product range (space grade available in green)		Size	Dielectric material	Capa.	Voltage	For space grade Capa.	For space grade Voltage	Tolerance	Use
Standard –55°C+125°C	CEC / CNC Series		0402 ⇨ 3040	NP0 BX 2C1 X7R	1 pF ⇨ 12 µF	10 V ⇨ 1 000 V	1 pF ⇨ 3.9 µF	10 V ⇨ 1 000 V	±0,25 ⇨ ±1 pF ±1% ⇨ ±20%	Precision, stability, decoupling.
	NON MAGNETIC Series		0505 ⇨ 2220	NP0 X7R	10 pF ⇨ 1 µF	50 V ⇨ 500 V	–	–	±1% ⇨ ±20%	
	OP Series		0805 ⇨ 2220	NP0 X7R	1 pF ⇨ 4.7 µF	10 V ⇨ 100 V	–	–	±0,25 ⇨ ±1 pF ±1% ⇨ ±20%	Precision, stability, decoupling. Significantly reduce risk of short circuit.
	CER / CNR Series		0306 ⇨ 0612	NP0 X7R	1 pF ⇨ 270 nF	16 V ⇨ 100 V	–	–	±1% ⇨ ±20%	Decoupling, low ESL, medical embedded.
	C3N - C4N - C3E - C4E Series		–	NP0 X7R	4.7 pF ⇨ 33 nF	25 V ⇨ 200 V	–	–	±0,25 ⇨ ±1 pF ±1% ⇨ ±20%	Medical embedded, miniaturization.
	30 S4 Series		–	NP0 X7R	470 pF ⇨ 820 nF	40 V ⇨ 100 V	–	–	±1% ⇨ ±20%	Railway.
	TCE / TCX / TCN / TXR Molded Series		–	NP0 BX 2C1 X7R	1 pF ⇨ 4.7 µF	25 V ⇨ 500 V	–	–	±0,25 ⇨ ±1pF ±1% ⇨ ±20%	Precision, stability, decoupling.
	LA Series		–	NP0 Temp. coeff.	1 pF ⇨ 680 nF	25 V ⇨ 63 V	–	–	±0,25 ⇨ ±1 pF ±1% ⇨ ±20%	Decoupling.
	TCE / TCX / TCN / TXR Axial Series		–	NP0 BX 2C1 X7R	1 pF ⇨ 3.9 µF	25 V ⇨ 500 V	–	–	±0,25 ⇨ ±1 pF ±1% ⇨ ±20%	Precision, stability, decoupling.
	TCE / TCX / TCN / TXR Conformal Coated Series		–	NP0 BX 2C1 X7R	1 pF ⇨ 6.8 µF	25 V ⇨ 500 V	–	–	±0,25 ⇨ ±1 pF ±1% ⇨ ±20%	Precision, stability, decoupling.
	NON MAGNETIC Conformal Coated Series		–	NP0 X7R	180 pF ⇨ 1 µF	63 V ⇨ 500 V	–	–	±1% ⇨ ±20%	Precision, stability, decoupling.
	CK Series		–	BX	10 pF ⇨ 1.5 µF	25 V ⇨ 250 V	–	–	±10% ⇨ ±20%	Decoupling.

	T°	Product range (space grade available in green)		Size	Dielectric material	Capa.	Voltage	For space grade Capa.	For space grade Voltage	Tolerance	Use
High voltage	−55°C +125°C	C series		1515 ⇨ 16080	NP0 C4xx X7R	10 pF ⇨ 39 µF	200 V ⇨ 10 000 V	10 pF ⇨ 6.8 µF	250 V ⇨ 10 000 V	±1% ⇨ ±20%	Power supply, voltage multiplier, radars. • aeronautic • space • defense • railways
		TCK Series		–	NP0 C4xx X7R	10 pF ⇨ 39 µF	200 V ⇨ 10 000 V	10 pF ⇨ 6.8 µF	250 V ⇨ 10 000 V	±1% ⇨ ±20%	
		TCL Series		–	NP0 C4xx X7R	10 pF ⇨ 39 µF	200 V ⇨ 10 000 V	–	–	±1% ⇨ ±20%	
		TCF Series		–	NP0 C4xx X7R	10 pF ⇨ 39 µF	200 V ⇨ 10 000 V	10 pF ⇨ 6.8 µF	250 V ⇨ 5 000 V	±1% ⇨ ±20%	
		TKD Series		–	NP0 C4xx X7R	10 pF ⇨ 39 µF	200 V ⇨ 10 000 V	10 pF ⇨ 2.7 µF	250 V ⇨ 5 000 V	±1% ⇨ ±20%	
		CF/CFS Series NEW		1812 ⇨ 16080	C4xx	27 pF ⇨ 15 µF	500 V ⇨ 10 000 V	–	–	±2% ⇨ ±20%	
		CS Series		2020 ⇨ 16080	NP0 C4xx X7R	220 pF ⇨ 15 µF	1 000 V ⇨ 10 000 V	–	–	±1% ⇨ ±20%	
High capacitance	−55°C +125°C	R Series (chips)		2225 ⇨ 45107	X7R	47 nF ⇨ 27 µF	50 V ⇨ 500 V	–	–	±10% ⇨ ±20%	Switch Mode Power Supply, filtering, smoothing, decoupling. • aeronautic • space • defense
		R Series (leaded)		–	X7R	47 nF ⇨ 27 µF	50 V ⇨ 500 V	–	–	±10% ⇨ ±20%	
		TEF series		–	NP0	10 nF ⇨ 680 nF	63 V ⇨ 500 V	–	–	±1% ⇨ ±20%	
		SV / SC Series		2225 ⇨ 125205	X7R	47 nF ⇨ 390 µF	50 V ⇨ 500 V	–	–	±10% ⇨ ±20%	
		CNC3X Series		2220 ⇨ 4040	X7R	1.2 µF ⇨ 68 µF	16 V ⇨ 25 V	1.2 µF ⇨ 68 µF	16 V ⇨ 25 V	±10% ⇨ ±20%	
		CNC5X Series						100 nF ⇨ 180 µF	50 V ⇨ 500 V		
		CEC5X Series		3033 ⇨ 80150	NP0	10 nF ⇨ 6.8 µF	63 V ⇨ 500 V	–	–	±1% ⇨ ±20%	
		TEP / TEV series		–	NP0	10 nF ⇨ 6.8 nF	63 V ⇨ 500 V	–	–	±1% ⇨ ±20%	
		TCN8X Series			X7R	0.47 µF ⇨ 120 µF	63 V ⇨ 500 V	–	–	±10% ⇨ ±20%	
High temperature	−55°C +250°C	CE / CN Series		0402 ⇨ 3040	NP0 X7R	1 pF ⇨ 8.2 µF	16 V ⇨ 100 V	–	–	±0,25 ⇨ ±1pF ±1% ⇨ ±20%	Oil drilling, motor control, braking systems.
	−55°C +215°C	SCT Series		2225 ⇨ 25205	X7R	47 nF ⇨ 390 µF	50 V ⇨ 500 V	–	–	±10% ±20%	
	−55°C +220°C	TCE/TCN Molded Series HT		–	NP0 X7R	1 pF ⇨ 10 µF	16 V ⇨ 100 V	–	–	±0,25 ⇨ ±1pF ±1% ⇨ ±20%	
	−55°C +250°C	TCE / TCN Self protected Series		–	NP0 X7R	10 pF ⇨ 3.9 µF	25 V ⇨ 500 V	–	–	±0,25 ⇨ ±1pF ±1% ⇨ ±20%	
		TCH Series		–	NP0 X7R	10 pF ⇨ 15 µF	200 V ⇨ 10 000 V	–	–	±1% ⇨ ±20%	
Feed-thru	−55°C +125°C	TBC series		–	NP0 X7R	10 pF ⇨ 5600 pF	25 V ⇨ 1 000 V	–	–	±1% ⇨ ±20%	Very low ESL
		BPM Series		–	X7R	330 pF ⇨ 68 nF	25 V ⇨ 200 V	–	–	±10% ⇨ ±20%	Very low ESL, miniaturization

RF CAPACITORS

High-Q CAPACITORS:

EXXELIA High-Q MLCC capacitors are designed to handle high power and high voltage ratings (from 1000 V to 7000 V) for applications in RF power amplifiers, base stations, filters, broadcasting, medical MRIs and industrial electronics. All series are RoHS with non-magnetic terminations available.

BROADBAND CAPACITORS:

EXXELIA Broadband capacitors allow a flat insertion loss up to 35 GHz, ideal for high-end optical network infrastructure.

		T°	Product range (space grade available in green)		Size	Dielectric material	Capacitance	Voltage	For space grade Capacitance	For space grade Voltage	Tolerance	Use
High Q	Classic	−55+175°C	CH Series		0505 ⇨ 1111	P100	0.1 pF ⇨ 1 nF	50 V ⇨ 1 500 V	0.1 nF ⇨ 1 nF	50 V ⇨ 1 500 V		Cellular base station amplifier, MRI.
	Super	−55+150°C	SH series		0402 ⇨ 1210	NP0	0.2 pF ⇨ 1 nF	25 V ⇨ 1 500 V	—	—		Cellular base station equipment Broadband Point to point/ multi-point radios RF generators
	reverse geometry	−55°C +175°C	SHD / SHR-Series		0709 ⇨ 0711	NP0	0.5 pF ⇨ 100 pF	500 V	—	—	±0.05 pF ⇨ ±0.5 pF	
	HSRF	−55°C +125°C	NHB Series		1111	NP0	0.3 pF ⇨ 100 pF	500 V	—	—	±1% ⇨ ±10%	
	High Power	−55°C +125°C	CP Series		2225 ⇨ 4040	P100	1 pF ⇨ 10 nF	200 V ⇨ 7 000 V	—	—		RF power amplifier Plasma chamber MRI coils
			CL Series		2225 ⇨ 7065	NP0	1 pF ⇨ 10 nF	200 V ⇨ 7 000 V	—	—		
Broadband	eXtra	−55°C +125°C	XBL Series		EIA 0402	X7R	100 nF	16 V	—	—	±10%	Optoelectronics / High-speed data Broadband test equipment & applications Broadband microwave/ millimeter wave amplifiers & oscillators
	Ultra	−55°C +125°C	UBL Series		EIA 0402	X7R	100 nF	16 V	—	—	±10%	
		−55+105°C	UBZ Series		EIA 0201	X5R X6T	100 nF	10 V	—	—	±10%	

MICROWAVE COMPONENTS

TRIMMER CAPACITORS

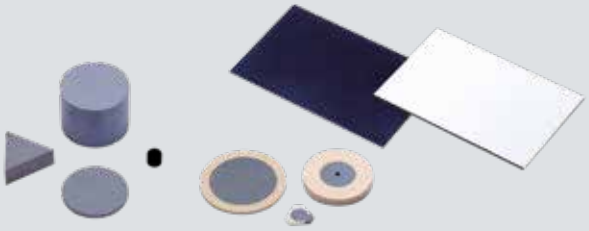
EXXELIA is one of the few suppliers in the world able to offer a wide range of RoHS trimmer capacitors using ceramic, air or sapphire as dielectrics. A broad range of capacitances, voltages and temperature coefficients are available.

TUNING ELEMENTS

Frequency Tuning Elements with self locking mechanism are high precision crews for cavity filter tuning. INVAR versions are available (space applications).

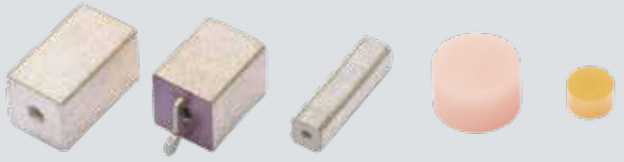
FERRITE MATERIALS

Mostly intended for isolators and circulators sub-systems used in radio communication systems, ferrite materials from **EXXELIA** are offered in disks, triangles and special custom designed dimensions. They are all based on **EXXELIA** own formulation providing low ΔH propitious to IMD reduction.



DIELECTRIC & COAXIAL RESONATORS

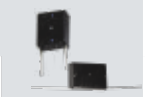
EXXELIA offers a wide range of dielectric resonators with high "Q" factor and dielectric constant from 24 to 78.
The coaxial resonators products can be used between 300 MHz and 6 GHz and are available in dimensions from 2 x 2 to 12 x 12 mm, allowing the best compromise between impedance, "Q" factor and resonant frequency.



TANTALUM CAPACITORS

Tantalum capacitors offer the highest charge per unit of volume combined with extremely high reliability and durability. **EXXELIA** manufactures an extensive range of solid (MnO_2 and polymer technologies) and wet tantalum capacitors for demanding applications such as satellites, aircraft and defense electronics through MIL and DSCC-qualified series.

Specific interfaces, package size and characteristics are available upon request.

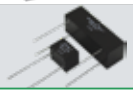
		Product range		Detail specification	Capacitance	Voltage	Operating Temperature	Main features
Wet tantalum capacitors	Tantalum cases - Axial	CT79 / CT79 SMD CT79E / CT79E SMD		CECC 30202-005/001/801 ESCC 3003/005	1.7 µF ⇨ 2 200 µF	6 V ⇨ 150 V	–55°C+125°C	Reverse voltage - High ripple current
		ST79 / ST79 SMD		According to DSCC 93026 ESCC 3003/006	10 µF ⇨ 1 800 µF	25 V ⇨ 125 V	–55°C+125°C	High capacitance
		CT79 HT200 - CT79E HT200 ST79 HT200		According to CECC 30202-005/001/801	1.7 µF ⇨ 2 200 µF	6 V ⇨ 150 V	–55°C+200°C	High capacitance. High Temperature.
		WT83 / WS83		According to DSCC 10004	150 µF ⇨ 10 000 µF	10 V ⇨ 125 V	–55°C+125°C	Very high capacitance Enhanced performances
		DSCC 10004 NEW		DWG N°10004	220 µF ⇨ 10 000 µF	10 V ⇨ 125 V	–55°C+125°C	Very high capacitance Enhanced performances
		DSCC 93026 NEW		DWG N°93026	10 µF ⇨ 1 800 µF	6 V ⇨ 125 V	–55°C+125°C	Very high capacitance
		MIL 39006/22 NEW		MIL-PRF-39006/22 Failure rate Level M, P, R	1.7 µF ⇨ 1 200 µF	6 V ⇨ 125 V	–55°C+125°C	MIL QPL High Vibration option (H) - High ripple current
		MIL 39006/25 NEW		MIL-PRF-39006/25 Failure rate Level M, P, R	6.8 µF ⇨ 680 µF	25 V ⇨ 125 V	–55°C+125°C	MIL QPL High Vibration option (H) - High ripple current Extended range
	Silver case Axial	CT9 / CT9E		According to CECC 30202-004	3 µF ⇨ 2 200 µF	6.3 V ⇨ 150 V	–55°C+125°C	Silver case. Glass metal seal. Hermetical Extended range (CT9E)
		CT4 / CT4E		CECC 30202-003 (CT4) According to BS 9073 F008/F032 (CT 4E)	1.7 µF ⇨ 2 200 µF	6 V ⇨ 150 V	–55°C+125°C	Silver case. Seal and resin sealing Extended range (CT4E)
	Stackable moulded cases	SPE0844 / SPE0844S		–	27 µF ⇨ 6 000 µF	6 V ⇨ 375 V	–55°C+125°C	Parallel and serial assemblies of capacitors Reverse voltage - High ripple current
		AP31 / AP41 / AS31		–	27 µF ⇨ 40 000 µF	10 V ⇨ 450 V	–55°C+125°C	Parallel and serial assemblies of capacitors Very High Capa/Voltage. High reliability design
Polymer caps.	Moulded cases SMD	CTP21		–	47 µF ⇨ 560 µF	16 V ⇨ 75 V	–55°C+105°C	Very low ESR. High ripple current High surge current
		CTP42		–	68 µF ⇨ 1 200 µF	16 V ⇨ 75 V	–55°C+105°C	Assembly of 2 CTP21 in parallel Ultra low ESR. Extended Capacitance
Solid tantalum capacitors	Hermetically sealed metal cases - Axial	CTS1 / CTS1M		CECC 30201-001/002/801 MIL- PRF 39003/01 (CTS1M)	0.1 µF ⇨ 330 µF	6.3 V ⇨ 125 V	–55°C+125°C	Standard range. General purpose +125°C
		CTS13		CECC 30201-005	0.1 µF ⇨ 330 µF	6.3 V ⇨ 63 V	–55°C+85°C	Standard range. General purpose +85°C
		CTS32		CECC 30201-019	1 µF ⇨ 330 µF	6.3 V ⇨ 63 V	–55°C+125°C	Standard range. High surge current Reverse voltage
		CTS23		–	0.1 µF ⇨ 1 200 µF	6.3 V ⇨ 63 V	–55°C+125°C	Extended range. General purpose
		CTS33		–	0.1 µF ⇨ 1 000 µF	6.3 V ⇨ 63 V	–55°C+125°C	Extended range. Low leakage current
		CTS21 / CTS21E / CTS1M		CECC 30201-040 According to MIL- PRF 39003/09 (CTS21M)	5.6 µF ⇨ 1 000 µF	6.3 V ⇨ 63 V	–55°C+125°C	Low ESR. High ripple current High surge current
	Moulded cases	CTS41 / CTS41RSE		CECC 30201-037	0.1 µF ⇨ 150 µF	6.3 V ⇨ 50 V	–55°C+125°C	High surge current. Reverse voltage Low ESR (CTS41 RSE)
		CTS4		CECC 30201-003	0.1 µF ⇨ 150 µF	6.3 V ⇨ 50 V	–55°C+85°C	General purpose
	Moulded cases - SMD surface mount	CTC3 / CTC3E		–	0.1 µF ⇨ 680 µF	4 V ⇨ 50 V	–55°C+125°C	Standard chip size. General purpose Extended range (CTC3E)
		CTC4		–	0.1 µF ⇨ 100 µF	6.3 V ⇨ 50 V	–55°C+125°C	Standard chip size. General purpose High surge current
		CTC4RSE		–	4.7 µF ⇨ 1 000 µF	6.3 V ⇨ 50 V	–55°C+125°C	Low ESR. High ripple current High surge current
		CTC21 / CTC21E		CECC 30801-013 ESCC 3012/002 (CTC 21) ESCC 3012/003 (CTC 21E)	5.6 µF ⇨ 680 µF	6.3 V ⇨ 100 V	–55°C+125°C	Low ESR. High ripple current High surge current
		SMT47 NEW		–	47 µF ⇨ 1 500 µF	6.3 V ⇨ 63 V	–55°C+125°C	Extended Capacitance - Low ESR Enhanced performance
		CTC42 / CTC42E		–	12 µF ⇨ 1 500 µF	6.3 V ⇨ 80 V	–55°C+125°C	Assembly of 2 CTC21 / CTC21E in parallel.

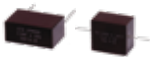
EXXELIA

FILM CAPACITORS

By using a wide range of plastics, Exxelia is able to cover all technical needs for use in a wide range of applications: from high temperature (PTFE) to power (polypropylene), energy conversion (polyester) or functions demanding a high level of stability (polyphenylene sulfide).

Exxelia film capacitors are available as standard or custom capacitors, and are suitable for every demanding end-markets including aerospace, thanks to numerous product series qualified to MIL and ESA specifications or high-end industry applications thanks to the recent addition of Alcon Electronics product lines.

	T (°C)	Product range (space grade available in green)		Dielectric	Capacitance	Tolerance	Voltage	Qualification	Use
MML	−55°C +140°C	NEW MML-C Series		MML™ Metallized Polymer	2,2 µF ⇨ 300 µF	±10 %	300 V ⇨ 1000 V	In house	**Breakthrough technology :** • Highest capacitance per volume • Up to 5 times lighter / 10 times smaller than traditional Film technologies
		NEW MML-D Series		MML™ Metallized Polymer	100 µF ⇨ 2 400 µF	±10 %	300 V ⇨ 1000 V	In house	
		NEW MML-M Series		MML™ Metallized Polymer	1,1 µF ⇨ 300 µF	±10 %	300 V ⇨ 1000 V	In house	
High Voltage	−55°C +125°C	HT Series		Reconstituted mica, resin impregnated	100 pF ⇨ 2.2 µF	±5 % ⇨ ±20 %	630 V ⇨ 20 000 V	ESA/ESCC (QPL HT96) Acc. ESA/ESCC (HT97)	High Voltage filtering. TWT Radar, Ignition System, Firing Caps, Oil & Gas
		430P		Polyester (P.E.T)	1 nF ⇨ 10.0 µF	±20% ⇨ ±5%	63 ⇨ 16 000 V	–	High Voltage
		CA 1 - CA 2		Silvered mica	4.7 pF ⇨ 100 nF	±0.5 pF or ±1 % ⇨ ±10 %	500 V ⇨ 5 000 V	CECC Acc. MIL C 5	Filtering circuits, delay line circuits, oscillators, pulse circuits, H.F. generators, emission lines, D.C. blocking circuits, coupling, measurement...
	−55°C +110°C	BIK Series		Metalized polyester/ polypropylene	1 nF ⇨ 6.8 µF	±5 % ⇨ ±20 %	400 V_{DC} 250 V_{AC}	in house	Standard applications
	−55°C +105°C	709G		Polypropylene	1 nF ⇨ 4.7 µF	±5 % ⇨ ±20 %	160 ⇨ 2 000 V	–	AC / DC & Pulse current
		PP 3 A - PP 3 M PR 3 A - PR 3 M		Metalized polypropylene +foil	680 pF ⇨ 1 µF	±5 % ⇨ ±20 %	630 V ⇨ 3 500 V 350 V_{AC} ⇨ 1 400 V_{AC}	in house	AC and pulse current
	−55°C +70°C	730G		Polypropylene	0.01 µF ⇨ 2.5 µF	±5 % ⇨ ±20 %	850 ⇨ 3 000 V	–	Snubber, industrial controls, AC drives and inverters, UPS, charging systems
	−55°C +85°C	MPA HT MRA HT		Metalized polyester	1 nF ⇨ 4.7 µF	±5 % ⇨ ±20 %	1000 V ⇨ 15000 V	in house	Standard applications
		PM 98 PM 980		Metalized plastic film	25 µF ⇨ 1 600 µF	±10 % ±20 %	300 V ⇨ 1 200 V	in house	Filtering, energy storage, flash
		PRA HT		Metalized polypropylene	1 nF ⇨ 10 µF	±5 % ±10 %	1000 V ⇨ 30 000 V	in house	High voltage
		RA ... - PS ...		Metalized polypropylene +foil	100 pF ⇨ 1 µF	±1 % ⇨ ±20 %	630 V ⇨ 2 000 V	in house	AC and pulse current
	−20°C +65°C	NEW DFC-11		Polypropylene	32 µF ⇨ 195 µF	±5% or custom	1750 ⇨ 5000 V	–	Automated External Defibrillators
	−25°C +85°C	BI 73 A - BI 73 R R 73 A - R 73 R		Bi-film Polyester + foil	1 nF ⇨ 2.2 µF	±5 % ⇨ ±20 %	1 000 V ⇨ 2 200 V Ucrete ⇨ 5 000 V	in house	Filtering, protection
DC Link	−40°C +85°C	NEW DCL-6		Metallized Polypropylene	4,7 µF ⇨ 120 µF	±10%	400 ⇨ 1500 V	IEC	High Frequency Inverters, On-Line UPS, Telecom SMPS, Solar Inverters, Frequency Converters
		NEW DCL-41		Metallized Polypropylene	50 µF ⇨ 2350 µF	±5% ±10%	700 ⇨ 2400 V	IEC	High Frequency and High Ripple Current Applications like High Frequency inverters, High KVA On-Line UPS, Telecom SMPS, Solar Inverters, Wind-Mill Power Supplies
	−40°C +105°C	NEW DCL-23		Metallized Polypropylene	12 µF ⇨ 265 µF	±5% ±10%	700 ⇨ 1800 V	IEC	
	−55°C +105°C	NEW DCL-50		Metallized Polypropylene	20 µF ⇨ 265 µF	±5% ±10%	700 ⇨ 1800 V	IEC	
		NEW DCL-14		Metallized Polypropylene	1 µF ⇨ 500 µF	±5% ±10%	500 ⇨ 1200 V	–	Renewable energy inverters, UPS, Battery Charger, Motor drives

	T (°C)	Product range (space grade available in green)		Dielectric	Capacitance	Tolerance	Voltage	Qualification	Use
High Capacitance	−65°C +125°C	MIL-PRF-83421/06		Polyphenylene Sulfide (P.P.S)	1 nF ⇨ 22 µF	±0.25% ⇨ ±10%	30 ⇨ 400 V	MIL QPL	Precision capacitors Low TCC
	−55°C +125°C	218P		Polyester (P.E.T)	1 nF ⇨ 12.0 µF	±5% ⇨ ±20%	100 ⇨ 400 V	MIL QPL	Coupling, energy discharge, energy storage
		842P		Metallized P.P.S	10 nF ⇨ 15.0 µF	±2% ⇨ ±10%	50 ⇨ 200 V	MIL QPL	Filtering, timing, energy storage
		A 64 S4 (T) - A 74 S4 (T) PMR 4 (T)		Polyphenylene Sulfide (P.P.S)	1 nF ⇨ 33 µF	±1 % ⇨ ±20 %	40 V ⇨ 630 V	NF F 62 102	Safety capacitors for signalling and others railways applications.
		KM 111 (T)(S)		Polyphenylene Sulfide (P.P.S)	1 nF ⇨ 15 µF	±1 % ⇨ ±20 %	40 V ⇨ 400 V	ESA (EPPL) / CECC - MIL QPL	Precision capacitors (Capacitance stability, low tolerance) Measurement, control electronics. AC filtering (400 Hz and others).
		KM 501-601(T) KM 50-60(T)		Polyphenylene Sulfide (P.P.S)	1 nF ⇨ 22 µF	±1 % ⇨ ±20 %	40 V ⇨ 630 V	CECC	
		KM 311-KM 21 (T) KM 711-KM 7 (T)		Polyphenylene Sulfide (P.P.S)	1 nF ⇨ 22 µF	±1 % ⇨ ±20 %	40 V ⇨ 630 V	CECC	
		PM 90 (S) PM 94 (S)		Metalized polyester (P.E.T)	8.2 nF ⇨ 150 µF	±5 % ⇨ ±20 %	50 V ⇨630 V	ESA/ESCC (EPPL, QPL)	High frequency switch mode power supplies, SMD. • defense • aeronautic • space
		PM 948(S) PM 907(S)		Metalized polyester (P.E.T)	22 nF ⇨ 180 µF	±10 % ±20 %	63 V ⇨1250 V	ESA / ESCC	
	−55°C +100°C	PM 96(S) PM 96 T(S) MKT(S)		Metalized polyester (P.E.T)	33 nF ⇨ 100 µF	±5 % ⇨ ±20 %	25 V ⇨630 V	Acc. ESA	
	−55°C +125°C	PMR 64 (T) PMA 64 (T)		Polyphenylene Sulfide (P.P.S)	470 pF ⇨ 22 µF	±1 % ⇨ ±20 %	40 V ⇨ 630 V	in house	
	−55°C +105°C	735P		Metalized polypropylene (P.P)	1.0 µF ⇨ 30.0 µF	±5 % ⇨ ±20 %	100 ⇨ 400 V	MIL QPL	SMPS
	−40°C +85°C	PM 50 - PM 60		Metalized polyester (P.E.T)	1 nF ⇨ 22 µF	±5 % ⇨ ±20 %	40 V ⇨630 V	CECC / IEC	Standard applications.
	0 +40°C	682P		Polypropylene (P.P)	5.0 µF ⇨ 100 µF	+20% −10%, ±10%	800 ⇨ 1 200 V	–	Energy storage
		684P		Metalized polyester (P.E.T)	5.0 µF ⇨ 175 µF	+20% −10%, ±10%	400 ⇨ 1 000 V	–	Flash, laser, strobe
High Temperature	−55°C +200°C	253P		PTFE	22 nF ⇨ 1 µF	±5% ±10%	250 ⇨ 800 V	–	Oil & Gas Aerospace & Defense High Temperature Modules
	−55°C +180°C	560P		Metallized Polymer	0.1 µF ⇨ 10 µF	±5% ±10%	320 V	–	Aerospace & Defense High Temperature Modules Industrial
	−55°C +150°C	880P		Metallized P.P.S	4.7 nF ⇨ 10.0 µF	±2%⇨ ±10%	50 ⇨ 400 V	–	Timing, feedback circuits, filtering, decoupling
		CM 04 to CM12 CMR 04 to CMR 07		Silvered mica	200 pF ⇨ 1200 pF	±0.5 pF or ±1 % ⇨ ±5 %	100 V ⇨ 500 V	CECC Acc. MIL C 5	Filtering, timing, oscillators, pulse, RF, D.C. blocking, coupling, measurement...
Power Film	−40°C +85°C	FP-4-150 NEW		Polypropylene (P.P)	0,005 µF ⇨ 2,4 µF	±10%	400 ⇨1000 Vrms	Conduction cooled	Induction Heating, Electric Cars, Medical Imaging, EV Wireless Chargers, Resonant Circuits
		FP-5-200 NEW		Polypropylene (P.P)	0,005 µF ⇨ 2,4 µF	±10%	450 ⇨1000 Vrms	Conduction cooled	
		FP-7-300 NEW		Polypropylene (P.P)	0,25 µF ⇨ 5 µF	±10%	400 ⇨700 Vrms	Conduction cooled	
		FP-1-400 NEW		Polypropylene (P.P)	0,33 µF ⇨ 5 µF	±10%	500 ⇨1000 Vrms	Conduction cooled	
		FP-11-500 NEW		Polypropylene (P.P)	1,2 µF ⇨ 37 µF	±10%	500 ⇨1100 Vrms	Conduction cooled	
		FP- 60-700 NEW		Polypropylene (P.P)	5 µF ⇨ 85 µF	±10%	500 ⇨1000 Vrms	Conduction cooled	
		FP-8C-1500 NEW		Polypropylene (P.P)	0,5 µF ⇨ 24 µF	±10%	500 ⇨1000 Vrms	Water cooled	

FILM CAPACITORS

	T (°C)	Product range		Dielectric	Capacitance	Tolerances	Voltage range	Qualification	Use
Standard	−65°C +125°C	132P		Paper/polyester	1 nF ⇨ 1.0 µF	+20% −10% ⇨ ±10%	100 V ⇨ 1 000 V	MIL QPL	Pulse coupling, snubber
	−55°C +85°C	PM 7 - PM 12 PM 720 - PM 730		Metalized polyester (P.E.T)	82 pF ⇨ 10 µF	±5 % ⇨ ±20 %	63 V ⇨ 630 V	CECC / IEC	Precision capacitors
		PP 78 Series		Metalized polypropylene	1 nF ⇨ 10.2 µF	±1 % ⇨ ±20 %	160 V ⇨ 630 V	UTEC/NFC	AC/DC current, standard applications
		P.P.S 13 P.P.S 16 A - P.P.S 16 R PP 318 - PP 418		Polypropylene + foil	100 pF ⇨ 603 nF	±1 % ⇨ ±20 %	63 V ⇨ 1000 V	in house	AC/DC and pulse current
	−55°C +125°C	410P		Polyester	1 nF ⇨ 5.0 µF	+20% −10% ⇨ ±10%	50 ⇨ 600 V	–	
		442P		Metalized polyester (P.E.T)	10 nF ⇨ 10.0 µF	±5% ⇨ ±20%	63 ⇨ 400 V	–	AC / DC Current
		431P		Metalized polyester (P.E.T)	10 nF ⇨ 15.0 µF	±5% ⇨ ±20%	63 ⇨ 630 V	–	Blocking, filtering, bypass
		810P		Polyphenylene Sulfide (P.P.S)	1 nF ⇨ 1.0 µF	±5% ⇨ ±20%	50 ⇨ 400 V	–	Precision capacitors Low TCC
		882P		Polyphenylene Sulfide (P.P.S)	1 nF – 0.22 µF	±10% ⇨ ±2%	200 V	–	Timing, high stability
		859P 860P		Polyphenylene Sulfide (P.P.S)	10 nF ⇨ 10.0 µF	±5% ⇨ ±20%	80 ⇨ 440 V_{RMS}	MIL QPL	Filtering, motor run, speed control
		CA 15 - 20 - 30 - 40 CA 152 to 158		Silvered mica	4.7 pF ⇨ 15 nF	±1pF or ±1 % ⇨ ±10%	63 V ⇨ 500 V	CECC Acc. MIL C 5	Filtering circuits, delay line circuits, oscillators, pulse circuits, H.F. generators, emission lines, D.C. blocking circuits, coupling, measurement...
		KCP 4 UA T		Film-foil P.P.S	7.5 nF ⇨ 777 nF	±2 % ±5 %	630 V ⇨ 1000 V	Acc. NF F 62 102	Safety capacitors for signalling and others railways applications.
		KM 78 - 82 - 90 - 97		Polyphenylene Sulfide (P.P.S)	1 nF ⇨ 10 µF	±1 % ⇨ ±20 %	40 V ⇨ 208 V	in house	Precision capacitors (Capacitance stability, low tolerance) Measurement, control electronics. AC filtering (400 Hz and others).
		KM 915		Metalized P.P.S	1.5 nF ⇨ 2.7 µF	±5 % ⇨ ±20 %	250 V_{DC} ⇨ 630 V_{DC} 150 V_{AC} ⇨ 400 V_{AC}	–	AC filtering 400 Hz
		KM 94 (S)		Metalized P.P.S	1 nF ⇨ 1.2 µF	±1 % ⇨ ±20 %	40 V ⇨ 100 V	ESA/ESCC (EPPL)	High stability, SMD.
	−55°C +105°C	700P		Polypropylene P.P	0.01 µF ⇨ 1.0 µF	±5% ⇨ ±20%	200 ⇨ 800 V	–	Coupling, filtering, timing
		710P		Polypropylene P.P	1 nF ⇨ 1.0 µF	±5% ⇨ ±20%	200 ⇨ 800 V	MIL QPL	High current, oscillator circuits, SMPS
		730P / 731P		Metallized P.P	22 nF ⇨ 10.0 µF	±5% ⇨ ±20%	160 ⇨ 630 V	–	AC / DC & Pulse current
		734G		Metallized P.P	0.47 µF ⇨ 10.0 µF	±5% ⇨ ±20%	400 ⇨ 600 V	–	Low inductance
		744G		Metallized P.P	0.47 µF ⇨ 3.5 µF	±5% ⇨ ±20%	600 V	–	Timing, telecommunications
IGBT Snubber	−40°C +105°C	MKRS NEW		Metallized P.P	0,1 µF ⇨ 2 µF	±5% ⇨ ±10%	600 V_{DC} ⇨ 2500 V_{DC}	IEC	Multi level IGBT snubber
		MP-4A NEW		Metallized P.P	0,015 µF ⇨ 5 µF	±5% ⇨ ±10%	600 V_{DC} ⇨ 3000 V_{DC} 275 V_{AC} ⇨ 750 V_{AC}	IEC	IGBT Protection, Snubber Networks Protection Circuits, SMPS
	−40°C +85°C	KP-3C NEW		P.P	0,1 µF ⇨ 3 µF	±5% ⇨ ±10%	1000 V_{DC} ⇨ 2000 V_{DC} 480 V_{AC} ⇨ 750 V_{AC}	–	IGBT Protection, Resonance Tank Circuits
		KPF NEW		Metallized P.P	0,1 µF ⇨ 3,3 µF	±5% ⇨ ±10%	1000 V_{DC} ⇨ 3000 V_{DC} 480 V_{AC} ⇨ 700 V_{AC}	IEC	IGBT Protection, Snubber Networks Protection Circuits, SMPS
		MP4 NEW		Metallized P.P	0,1 µF ⇨ 6,3 µF	±5% ⇨ ±10%	700 V_{DC} ⇨ 3000 V_{DC} 420 V_{AC} ⇨ 750 V_{AC}	IEC	IGBT Protection, Snubber Networks Protection Circuits, SMPS
		KPF-9 NEW		Metallized P.P	0,068 µF ⇨ 1,5 µF	±5% ⇨ ±10%	850 V_{DC} ⇨ 3000 V_{DC} 450 V_{AC} ⇨ 750 V_{AC}	IEC	IGBT Protection, Resonance Tank Circuits

ELECTROLYTIC ALUMINUM CAPACITORS

EXXELIA is the only manufacturer who develops its own electrolytes, enabling to its aluminum electrolytic capacitors to achieve the longest lifetime of the market, provide very high energy density and offer the widest temperature range (–55°C +125°C). They are particularly suitable for D.C voltage applications in energy storage (lighting flash lamps, welding machines, radiology, radars) and time delay devices. Since late 2021, Exxelia joined forces with Alcon Electronics and now offers their large range of screw terminals series for high-end industrial applications such as rail traction, EV charging stations and power supplies applications.

	T° (°C)	Product range		Sizes Ø x h (mm)	Capacitance	Voltage	Main characteristics
Screw terminals	–55°C +125°C	FELSIC 125FRS	BC 	36x52 to 90x145	220 µF to 150 000 µF	16 V to 350 V	Low ESR, +125°C
	–55°C +105°C	FELSIC HV		51x81 to 90x200	1 000 µF to 47 000 µF	160 V to 450 V	Extreme Long life, High ripple
		FELSIC 105		36x52 to 90x200	100 µF to 470 000 µF	16 V to 450 V	Extreme Long life
	–55°C +85°C	FELSIC HC	BD 	36x44 to 90x220	100 µF to 2.7 F	10 V to 500 V	High energy density achieve the same capacitance with twice as less capacitors
		FELSIC 85		36x52 to 90x200	68 µF to 680 000 µF	10 V to 630 V	Standard 85°C
	–40°C +70°C	PG-2HD NEW PG-PED2		50x105 to 90x220	680 µF to 6 800 µF	350V to 450V	For instant high energy discharge
	–40°C +85°C	PG-6DI NEW		35x62 to 90x240	330 µF to 470 000 µF	50V to 550V	Filter, energy storage, UPS, General purpose power supplies
		PG-LL9 Long Life NEW		50x80 to 120x240	1000 µF to 38 000 µF	315V to 450V	High voltage and high ripple current applications
	–40°C +105°C	PG-8K NEW		35x62 to 90x220	1000 µF to 200 000 µF	50V to 500V	High Ripple current applications such as PMW inverters, high KVA on-line UPS, frequency converters, AC drives
		PG-5K Long Life NEW		50x80 to 90x220	680 µF to 18 000 µF	350V to 500V	High Ripple current applications such as PMW inverters, high KVA on-line UPS, frequency converters, AC drives, railway traction, high relibility power supplies, solar inverters
Radial leaded type	–55°C +105°C	CUBISIC		35x35x16 to 35x50x16	100 µF to 33 000 µF	10 V to 400 V	Flatpack, Withstand 20 g vibrations, High energy density
	–55°C +125°C	CUBISIC HTLP NEW		45x38x14 to 45x76x14	140 µF to 60 000 µF	7.5 V to 350 V	Flatpack, Withstand 20 g vibrations, High energy density Switch mode power supplies, impulse current. Withstands more than 92,000 feet altitude
	–55°C +85°C	CUBISIC SLP NEW		45x38x12 to 45x76x12	220 µF to 68 000 µF	10 V to 450 V	Flatpack, Withstand 20 g vibrations, High energy density Switch mode power supplies, impulse current. Withstands more than 92,000 feet altitude
	–55°C +105°C	ALSIC 20g		18x20 to 35.5x25	110 µF to 68 000 µF	10 V to 500 V	Withstand 20 g vibrations
	–55°C +145°C	ALSIC 145 20g		18x20 to 22.5x25	470 µF to 2 200 µF	10 V to 115 V	High temp. range, Long life, withstand 20 g vibrations
Snap in type	–55°C +125°C	Snapsic 125		22x25 to 35x50	470 µF to 47 000 µF	16 V to 100 V	High temperature range, Long Life
	–55°C +105°C	Snapsic HV		22x25 to 35x50	47 µF to 2 200 µF	160 V to 500 V	Long Life, High ripple current
		Snapsic 105		22x25 to 35x50	22 µF to 68 000 µF	16 V to 500 V	Standard 105°C type
	–55°C +85°C	Snapsic HC NEW		22x25 to 35x50	47 µF to 47 000 µF	25 to 450 V	High energy density
		Snapsic		22x25 to 35x50	22 µF to 47 000 µF	16 V to 500 V	Standard 85°C type
	–55°C +105°C	Snapsic 105 4P		35x50 to 45x75	330 µF to 150 000 µF	16 V to 550 V	Standard 105°C type with 4 Pins
		Snapsic 105 LP		45x21 to 45x40	150 to 68 000 µF	16 V to 500 V	Low Profile 105°C with 4 Pins
	–55°C +85°C	Snapsic 4P		35x50 to 45x100	330 to 150 000 µF	16 V to 500 V	Standard 85°C type with 4 Pins
Axial type	–55°C +150°C	Prorelsic 145		14x30 to 25x75	6.8 to 10 000 µF	16 V to 450 V	High temperature Long life
		Vacsic 150		14x30 to 16x30	6.8 to 3 300 µF	16 V to 450 V	High temperature Long life, Withstand 45 g vibrations
	–55°C +125°C	Prorelsic 125		12x25 to 25x75	1 to 15 000 µF	10 V to 350 V	125°C Long life
	–55°C +105°C	Vacsic 105		12x25 to 16x30	15 to 4 700 µF	10 V to 450 V	Standard 105°C type; Withstand 45 g vibrations.
	–55 °C +85°C	Sical /Sical C042		6.5x19 to 25x75	6.8 to 47 000 µF	10 V to 630 V	Standard 85°C type

Still available on demand : FELSIC 105TFRS, FELSIC 105LP, FELSIC 85M, FELSIC 039 / 037

MAGNETIC CATALOG PRODUCTS

EXXELIA designs and manufactures magnetic components including wound magnetics, inductors, transformers, motors, sensors and actuators for high voltage, high temperature and power applications.

EXXELIA offers high-grade and standard technologies for high power or low power applications. Both technologies are available either as catalog product series (already developed) or as technologies for custom products (with engineering support from **EXXELIA**).

HIGH GRADE PRODUCTS

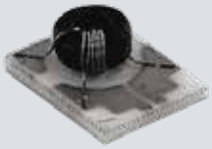
	Product Series		Current	Inductance	Temperature Range	Frequency	Notes
Chips Inductors	MPCI/MSCI 10000, 12000, 20000		15 mA to 1 000 mA	0.010 µH to 1 000 µH	–55°C to +125°C	7.9 MHz to 500 MHz	QPL, Space Qualified
	MPCI/MSCI H01		100 mA to 1 500 mA	0.38 µH to 100 µH	–55°C to +125°C	–	QPL, Space Qualified
	MPCI 233		25 mA to 114 mA	18 µH to 1 000 µH	Up to +175°C	–	High Temperature
	MPCI 233 H01		100 mA to 1 500 mA	0.38 µH to 100 µH	Up to +175°C	–	High Temperature
Wide Band RF	WRFT 4x		–	–	–55°C to +125°C	Bandwidth 100 kHz to 400 MHz	Generic specification ECSS, ESCC, MIL for Space
C. Mode Choke	HCESC		0.4 A to 2.5 A	15 µH to 470 µH	–55°C to +125°C	Up to 100 MHz	Generic specification ECSS, ESCC, MIL for Space
Data Line Filters	DLEF 42		Up to 100 mA	5 µH at 15 MHz	–55°C to +100°C	15 MHz to 300 MHz	Generic specification ECSS, ESCC, MIL for Space
Line-Matching	MTLM 1234 MIL		–	Up to 5.5 µH	–55°C to +125°C	100 Hz to 10 kHz	Line isolation Impedance matching
Current Transfo.	DBIT / SBIT		MIL-STD-1553 Data Bus Transformer		–55°C to +125°C	75 kHz to 1 MHz	Aerospace, ESA / EPPL
Ethernet Transfo.	2 ways digital block NEW		–	–	–40°C to +125°C	–	Mechanical withstanding Very hash environment
SMD Power Inductors	ESI 01		0.26 A to 2.1 A	1.72 µH to 106.45 µH	–55°C to +125°C	Up to 1 MHz	Generic specification ECSS, ESCC, MIL for Space
	ESI 7		1.4 A to 6 A	0.42 µH to 8.42 µH	–55°C to +125°C	Up to 1 MHz	Generic specification ECSS, ESCC, MIL for Space
	CCM 4, CCM 5, CCM 6 CCM 20, CCM 25 NEW		0.33 A to 17.7 A	1 µH to 4680 µH	–55°C to +125°C	Up to 1 MHz	High Reliability Compliant ESA, ECSS, MIL
	SESI 9.1, 14, 15, 18, 22, 32		0.045 A to 24 A	1 µH to 6 800 µH	–55°C to +125°C	Up to 1 MHz	QPL, Space Qualified
	HTSE xx WR/SR		0,36 A to 16.4 A @ 25°C 0,2 A to 10,2 A @ 155°C	3 to 2041,3 µH no load 2.7 to 1837.2 µH @ 155°C	–55°C to +180°C	Up to 1 MHz	High Temperature QPL, Space Qualified
	HTSE 47 SR		1 A to 20 A @ 25°C 0,6 A to 12 A @t 155°C	1.3 to 5593.2 µH no load 1.2 to 5033.9 µH @ 155°C	–55°C to +180°C	Up to 1 MHz	High Temperature QPL, Space Qualified
Dif. Mode Choke	DMC 22 xxx 1WR		4 A	25 µH @ 25°C	–55°C to +125°C	–	Aeronautic, Space
Common Mode Choke	CMC 15, CMC 18, CMC 22		0.55 A to 14.3 A	60 µH to 4 900 µH	–55°C to +125°C	–	Aeronautic, ESA QPL
	CMC 14, CMC 17		1.1 A to 11.7 A	140 µH to 69 200 µH	–55°C to +125°C	–	ESA Generic Specification
	Current sense Transformer CT 10		–	2 mH	–55°C to +125°C	–	Compliant with ESCC3201 Generic
Current (sense) Transformers	CT 01 100 261 x		3.5 A	3.9 µH	–55°C to +125°C	10 kHz to 250 kHz	Aeronautic, Space
	CT 08 200 221 PR		8 A_{Peak} / 3.6 A max.	–	–40°C to +110°C	100 kHz to 200 kHz	Aeronautic, Space
	CT 91		10 A pk max. Turn ratio 1:50/1:200	0.4 µH to 6.4 µH	–55°C to +125°C	6 kHz to 500 kHz	Aeronautic, Space
	CT 15 200 231 WR		–	6.4 µH	–55°C to +125°C	6 kHz to 100 kHz	Aeronautic, Space
Gate drive transformers	GDT 15		ET: 60/80 V µs Turn ratio 1:1.52/1:1:1	–	–55°C to +125°C	Up to 500 kHz	Aeronautic, Space
	GDT 91		ET: 50/135 V µs Turn ratio 1:1/1:1:1	–	–55°C to +125°C	Up to 500 kHz	Aeronautic, Space

STANDARD PRODUCTS

	Product Series		Current	Inductance	R_{DC} Typ.	Temperature Range	Notes
Common Mode Chokes	TCM Series		0.3 A to 4 A	0,7 mH to 47 mH	0.15 mΩ to 1750 mΩ	–55°C to +125°C	Aeronautic, Industry, Defense, Railway
	CMESC Series		1.1 A to 11.7 A	0.45 mH to 69.2 mH	5 mΩ to 500 mΩ	–40°C to +125°C	Defense, Industry
Current transfo.	CT 05 xxx 231 W		2.2 A (1.5 A TYP)	1.2 mH to 540 mH	6 mΩ (A-B) 1 mΩ to 9.6 mΩ (1-3)	–40°C to +100°C	Defense, Industry

HIGH GRADE, HIGH POWER TECHNOLOGIES

HIGH GRADE TECHNOLOGIES



Custom Design Technologies
Hybrid Magnetics Transfer-Molded Components

CCM Technology
ESA ESCC 3201011 Technology Flow Certificate for custom designs.
Replace wire leads by regular output pins

SESI Custom Technologies
Custom transformers and inductors in the standard SESI 9, 15, 18, 22 and 32 packages

Custom Packages with Additional Terminations
Shielded versions of SESI

Toroidal Transfer Custom Magnetics TT and TO Toroidal
Pick and place custom toroidal magnetic components from leaded toroids to pick and place components

High Temperature Inductors and Transformers
High Temperature products withstanding up to 230°C

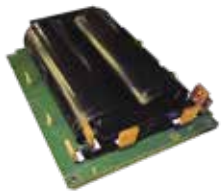
HIGH POWER TECHNOLOGIES

Aluminium and Copper Foil Technologies

High Grade Custom Planar Magnetics

U Shaped Ferrite assembly

Overmolded U Cores Assembly



Nanocristalline Toroidal Cores Assembly

Overmolded Nanocristallin Toroids

C Cores Assemblies

EI, U,… Lamination assemblies

Water Cooling

Sensor : Current transformer

Sensor : Voltage transformer

Integrated subassemblies

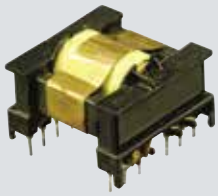
Winding flat wire on range

STANDARD TECHNOLOGY / BUILT TO PRINT

STANDARD TECHNOLOGIES

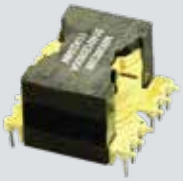
Toroidal Magnetic Core Platform
Power conversion
in electronic applications

RM Platform
Power Transformers
and Inductors in SMP power supplies

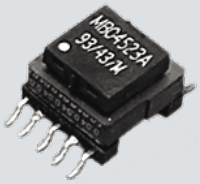


ETD Platform
Transformers in forward
and push-pull SMPS

EFD Platform
DC-DC converters, isolation
and pulse application



EQ Platform
Power transformers in
SMP power supplies



ER and EP Platform
Design know how
and manufacturing capabilities

Custom Power Magnetics
Powerful magnetics
for a wide range of applications

BUILT-TO-PRINT

Bobbins
For Actuators, Antennas & Sensors

Rotors & Stators
Stators diameter from 10 to 500 mm and weight up to 250 kg
Up to high temperature 220°C products:

ENGINEERING SUPPORT

Our Engineers use advanced finite-elements simulation software to model and analyse electromagnetic behavior. **EXXELIA** can provide the experience and the expertise of its technical team to:

- Full design, starting from the functional specifications, **EXXELIA** can explore different kind of topologies, with respect to the request.
- Optimization of an existing design (example: weight reduction, torque increase, losses reduction, etc…)

CAD geometry and circuit import/export (*.step, Catia, Spice, …)

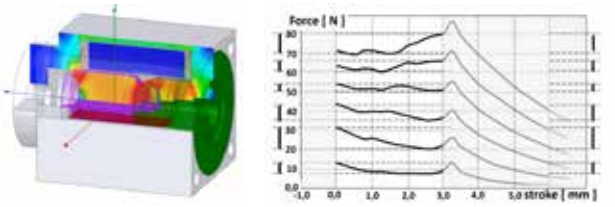
We can do for you the following analysis:

- Optimization under constraints
- Parametric analysis
- Sensitivity analysis

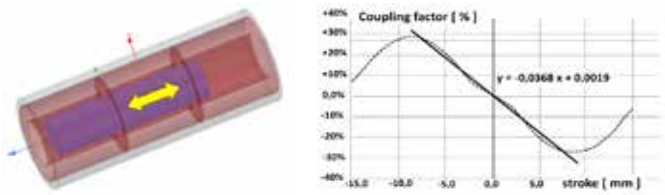
Some calculations: Torque [N.m], Force [N], Resistance [Ω], Losses[W], L matrix [H], C matrix [F]

Some applications: linear or angular electric motor, electromagnet, linear or angular actuator, proportional valves, position sensor, etc...

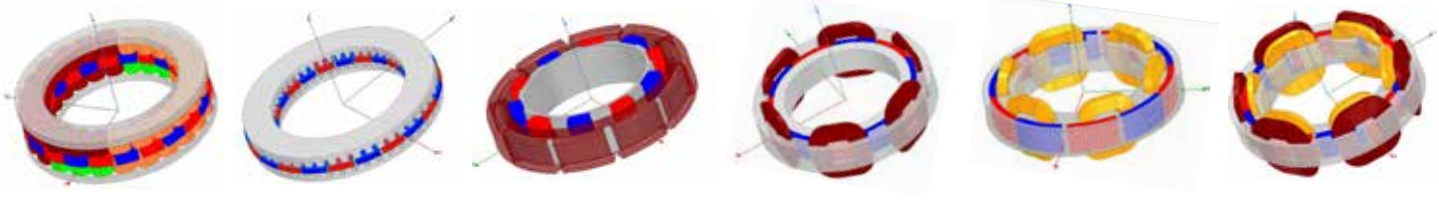
Proportional Hydraulic Valve



Linear Position Sensor



Design and Support for Electrical Motor Design



A FEW CUSTOM PRODUCTS

Flyback Transformers FLYT Series
MIL, ECSS Compliant

Push Pull Transformers
FL Serie

400 Hz Current Measurement
Transformer Custom Designs

400 Hz Current Measurement
Transformer Custom Designs

400 Hz Voltage Measurement
Transformer Custom Designs

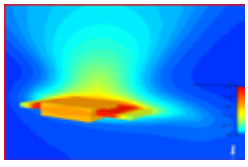
Magnetic Design Support
for Multi pulses Transformers

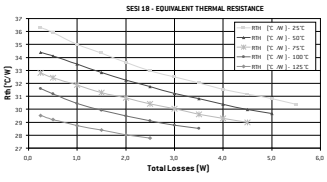
Design Support for Parallel
Multicellular Converters Inductors

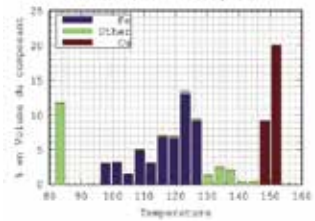
Design Support for
Integrated Magnetics

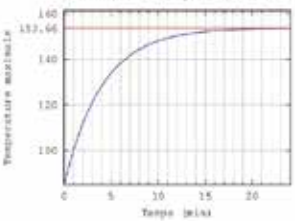
THERMAL MANAGEMENT

EXXELIA invests in R&D and makes extensive studies on the thermal management of magnetics, including loss calculations, design rules, thermal resistance and thermal modeling. We have available, a complete database of thermal resistances for all standard magnetics packages and have developed specific software for designing optimized compact components.









POSITION SENSORS & SLIP RINGS

EXXELIA designs and manufactures contact and contactless Position Sensors, Slip Rings and Hybrid Systems.

HIGH PERFORMANCE CONTACTLESS POSITION SENSORS

High accurate Optical Encoders
Accuracy 20 arcsec / resolution 21 bit

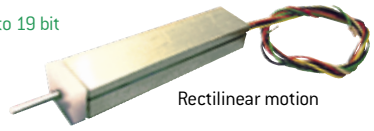

Size 15 (Ø 37 mm)


Size 23 (Ø 58 mm)


Size 09 (Ø 22 mm)


Size 11 (Ø 27 mm)

Magnetic Encoders
Accuracy 1.5 arcmin / resolution up to 19 bit


Rectilinear motion


Size 04
(Ø 10 mm)


Pancake type
Size 16 (Ø 40 mm)

SLIP RINGS

Diameter from 20 mm to 1 200 mm
and more on request

Electrical Slip Ring


Miniature
Slip Ring


Hollow Shaft

FORJ's

Fiber Optic
Rotary Joints

PRECISION POTENTIOMETERS

Linearity 0.01%

Rectilinear motion
Potentiometer

Rectilinear Joystick


Rotary Potentiometer
single or multi-turn


Pancake Potentiometer

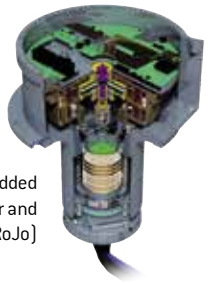

Space grade Potentiometer

HYBRID SYSTEMS

Slip Ring + FORJ


Electrical and hydraulic Slip Ring


Optical Encoder + FORJ

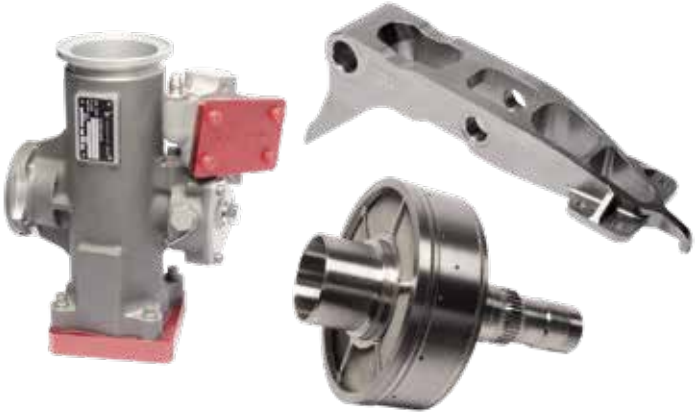

Slip Ring with embedded
FORJ, Optical Encoder and
RF Rotary Joint (RoJo)


Brushless LAT motor

PRECISION MECHANICS

EXXELIA's Precision Mechanics division specializes in machining complex parts, from prototypes to medium series. Our best-in-class palletized-5-axis turning and milling equipment enable us to work with all types of material including titanium, inconel, 35NCD4 etc…

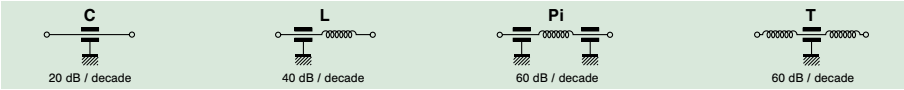
Assembly, high precision manual deburring and hydraulic tests can be carried out in our workshop.



EMI-RFI FILTERS

EXXELIA, is the only manufacturer in the world of ESA QPL EMI-RFI filters in different low pass configurations (C, L, Pi, T, 2 x Pi, 2 x L and 2 x T) intended to protect electronic equipment from interferences for aerospace, telecom and medical markets..

Capacitors are a key components in a filter and thanks to its expertise in the field, **EXXELIA** is able to man µFacture high-end solutions combining performance and reliability.



	T°	Model	Current	Voltage	Performance	Qualification	Use
EMI-RFI Filters	−55°C +125°C (up to 175°C)	**Feed through 0 3 - 0 4 - 0 6 - 0 10 (mm)**	Up to 15 A	Up to 500 V_{DC} and 115 V_{AC} 400 Hz	Up to 80dB from 10 kHz to 10 GHz	AIR Qualified Compliant MIL 461, D0160	Space, Aeronautic, Defense, Industry.
		Feed through 0 17 (mm)	Up to 30 A	Up to 3 000 V_{DC} and 200 V_{AC} 400 Hz	Up to 80dB from 10 kHz to 10 GHz	AIR qualified, Compliant MIL 461, D0160	Aeronautic, Defense, Industry.
		Multi ways Filters	Up to 15 A	Up to 500 V_{DC} and 115 V_{AC} 400 Hz	Up to 80dB from 10 kHz to 10 GHz	in house	Aeronautic, Defense, Industry.
		Surface mount FCMS - CFCMS	10 A (20 A for HI version)	Up to 500 V_{DC} and 115 V_{AC} 400 Hz	Up to 70 dB from 10 kHz to 10 GHz	In house	Space, Aeronautic, Defense, Industry.
		SPF...	Up to 500 A	Up to 3 000 V eff.	Up to 10 GHz	in house	Custom design

ENERGY FILTERS

Following 50 years heritage in Defense market, **EXXELIA** offers highly performant, robust and reliable solutions to protect from different EMC phenomenon all kind of signal such as:

- Power supply,
- Control lines,
- Data communication...

Asymmetric design available for optimized leakage current and size.

	T°	Model	Current	Voltage	Performance	Qualification	Use
EMC Filters	−55°C +85°C	**Feedthrough Tube filters**	Up to 500 A	Up to 1 000 V_{DC} and 400 V_{AC}	Up to 100 dB Up to 18 GHz*	–	Single lines power supply.
		Power cabinets	Up to 2 500 A	Up to 440 V_{AC} (50-800Hz)	Up to 100 dB from 10 kHz to 18 GHz*	**TEMPEST**: MIL-HDBK-1195 **HEMP**: MIL-STD-188-125-1 & 2	Three or single phase power supply for **TEMPEST** and **HEMP**
		Data communication	Up to 1A	–	Up to 100 dB Up to 18 GHz*	**TEMPEST**: MIL-HDBK-1195 **HEMP**: MIL-STD-188-125-1 & 2	Up to 100 MHz bandwidth data signal for **TEMPEST** and **HEMP**
		Custom filters	Additional protection for energy and signal filtering.				

* Up to 40 GHz on request.

COMPONENTS & SUB-ASSEMBLIES Manufacturing

With two production units located in competitive manufacturing countries, **EXXELIA** can provide cost-effective sub-assembly capabilities with high technology processes: wire bonding, vacuum metallization, overmolding, harnessing, RF tests, reliability tests.

EXXELIA OHMCRAFT RESISTORS

Precision Resistors for Demanding Applications where Reliability is Essential

EXXELIA Ohmcraft's thick-film, surface mount resistors are engineered to meet application specific needs. Our proprietary **EXXELIA Micropen**® electronic printing technology is the foundation for **EXXELIA Ohmcraft**'s family of resistor products. Our technology utilizes the proprietary **EXXELIA Micropen**® electronic printing system to "print" precise, narrow, serpentine lines with resistive ink on a ceramicsubstrate producing higher performance resistors over a wider range of values on a smaller surface area than is possible with conventional film resistor technology.

Common attributes for ALL EXXELIA Ohmcraft Resistors: High Stability, Low Noise, Low TCR, Low VCR & Custom Configurations.

	T°	Series		Case Size	Voltage Rating	Resistance Values	Ratio Tolerances	Advantages	Note
Surface Mount Resistors	−55°C +150°C	**UHVC Series** Ultra High Voltage Chip Resistors		2010 to 5020	Up to 20 kV	Up to 50 GΩ	to 1%	Ultra High Voltage	The highest voltage ratings available in the WORLD
		HVC Series High Voltage Chip Resistors		0402 to 5020	Up to 5 kV	Up to 50 GΩ	to 0.1%	High Voltage	EXXELIA Ohmcraft's flagship high voltage chip series
		HVCD Series High Voltage Chip Dividers		3512 4020 5020	Up to 4 kV	Up to 10 GΩ	to 1%	Surface Mount Divider	Replaces larger leaded divider
		SM Series High Resistance Chip Resistors		0402 to 3512	Up to 600 V	Up to 50 GΩ	to 0.1%	Ultra High Resistance	Excellent for high gain amplifier circuit
		MCH Series Military Grade High Voltage Chip Resistors		0402 to 5020	Up to 5 kV	Up to 50 GΩ	to 0.1%	Military Grade Inspection	Optionally tested to MIL-PRF-55342 MIL-PRF-49462 NASA EEE-INST-002 (Level 1 & 2)
		HC Series Hybrid Chip Series		0202 to 0505	Up to 100 V	Up to 50 GΩ	to 0.1%	Wire Bondable	Excellent for Shock & Vibration Sensors

Precision Leaded Through Hole Resistors

	T°	Series		Case Size	Voltage Rating	Resistance Values	Ratio Tolerances	Advantages	Note
LEADED RESISTORS	−55°C +225°C	**HVA Series** High Voltage Axial Resistors		05 to 50	Up to 50 kV	Up to 10 GΩ	to 0.1%	Non-Inductive	High precision, thick-film axial through hole resistors
	−55°C +150°C	**HVR Series** High Voltage Radial Leaded Resistors		21 to 56	Up to 40 kV	Up to 4 TΩ	to 0.1%	High Voltage	High precision, thick-film radial through hole resistors
		HVD Series High Voltage Radial Leaded Dividers		04 to 50	Up to 50 kV	Up to 2 TΩ	to 0.1%	Excellent TCR Tracking	High precision, thick-film radial through hole resistor dividers
		CN Series Custom Leaded Resistor Networks		Custom	Up to 100 kV	Up to 2 GΩ	to 0.1%	Customized Solution	Wide range of customization options available

Custom Solutions

Every day, we receive a phone call or email that starts out with, "We have an idea…" Many of the world's most respected and innovative companies, research institutions and government agencies have chosen **EXXELIA Ohmcraft** as a trusted collaborator, working with us to explore new possibilities for custom solutions.

EXAMPLES

Low Energy Neutral Atom Imager (LENA)

539 MΩ to 11.138 GΩ ±1%
Missiles & Space use

Custom Size for Handheld Application

50 kV Low V_{CR}
76,2 mm x 2,032 mm (3" x 0.080")

1G Seven Decade Divider

20 GΩ to 20 kΩ
Ratio Tol.: 0.25%
TCR Tracking: 25 PPM/C

EXXELIA MICROPEN® TECHNOLOGY

EXXELIA Micropen®'s proprietary printing technology enables product designers to bring forth their groundbreaking ideas or explore new possibilities that they once thought out of reach. Designers can DREAM BIGGER and DESIGN BETTER.

Our **EXXELIA Micropen**® printing process has pioneered additive printing from its early days. We take a substrate, any substrate, and print electronically conductive patterns, transforming the substrate into a critically important component that can sense, heat, detect, ablate or cauterize.

Our technology is the key to making materials more functional, more reliable and more customized.

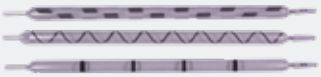
In today's 3D printing world, our technology turns static into smart by printing on virtually any 3D ceramic, metal or polymeric substrate.

MEDICAL DEVICE

Todays medical device market requires precision durable technology able to withstand a rugged enviroment witrhout affecting performance. **EXXELIA Micropen**® printing is the most precise and cost effective way of printing fine line, conformal traces of functional materials directly onto medical devices and 3D geometeries.

Endotracheal Tubes

Electrosurgical Devices



Radiopaque Markers

Ablation & Catheter Balloons

TEST & MEASUREMENT

EXXELIA Micropen® Technologies has material science and design engineering expertise along with a proven track record resulting in high-precision, robust, smaller, and smarter instrumentation devices.

EXXELIA Micropen®'s printing technology enables precision and repeatability required by modern measurement and detection equipment. A component designed from scratch, new versions with increased functionality, or becoming a second source provides a level of service and performance unmatched in the instrumentation market. Products features may include: Unmatched Design Flexibility, Superior Linearity and Stability, Robustness and Ruggedness, High Ohmic Values, Low Noise, Shrink product footprint, TCR tuning, Built-in feedback.

Laboratory Equipment

Thick Film Heater

Temperature Sensor

Precision Gauge

SECURITY & DETECTION

We recognize innovation as an essential element of successful military and space programs. **EXXELIA Ohmcraft** has served markets in electronic warfare, weapons platforms, force protection, intelligence and space programs for over two decades, reliably supporting a wide range of products, programs, and applications. Our custom resistors are designed to support the rigorous specifications required by military and space suppliers who depend on the precision and reliability of our products. **EXXELIA Ohmcraft** is able to screen and qualify our resistors to the following specifications: MIL-PRF-55342, MIL-PRF-49462, NASA EEE-INST-002 (Level 1 & 2).

Trace Detection
Drift Tube

Mass
Spectrometry

	Substrate	Common Tradenames*	Material applied by EXXELIA Micropen	Function Added	Applications Demonstrated
Polymers	Polyethylene Terephthalate (PET)	Mylar,® Melinex®	Ag, W	Conductivity, Radiopacity	Cardiac ablation balloon, lead on cardiac ablation wire guide
	Polyurethane	Texin,® Desmopan,® Tecothane,® Estane,® Pellethane®	Ag, TiO2	Conductivity, Opacity	Capsule antenna, electrode on sheath,visualization
	Silicone	SilMedic,® BioSil,™ Silikophen,® Nusil™	Ag, W	Conductivity, Radiopacity	Atrial ablation balloon, flexible brain stimulation electrode
	Silicone-Urethane Copolymer	Elast-Eon™	Ag, W	Conductivity, Radiopacity	Visualization
	Polyamide (Nylon)	Vestamid,® Grilamid®	Ag, W	Conductivity, Radiopacity	Sensing on balloon catheter
	Polyetheramide	PEBAX®	Ag, W	Conductivity, Radiopacity	Catheter stimulation and sensing, ablation catheter
	Polyetherimide	Ultem®	Ag	Conductivity	Stimulation
	Polyetherether Ketone	Vestakeep,® PEEK-Optima®	Ag, W	Conductivity, Radiopacity	Heater
	Polysulfone	Radel,® Udel,® Fortron®	Ag	Conductivity	Sensing
	Polytetrafluoroethylene (Etched)	Teflon®	Ag, W	Conductivity, Radiopacity	Visualization
	Polycarbonate	Makrolon,® Calibre,™ Lexan®	Ag, W	Radiopacity, Conductivity	Sensing on surgical device
	Polyvinylidene Fluoride	Dyflor,® Kynar®	W	Radiopacity	Visualization
	Polyvinyl Chloride	Nakan,® Chlorite™	Ag	Conductivity	Sensing on endotracheal tube
	Polyhydroxyalkanoate	Biopol,™ Mirel™	W	Radiopacity	Visualization
	Liquid Crystal Polymer	Vectra®	Ag	Conductivity	Heater, thermistor
	Poly(P-Xylylene)	Parylene™	Ag	Conductivity	Balloon electroporation
	Styrene-Butadiene	Styrolux®	Ag	Conductivity	Opthalmic electroporation
Metals	Stainless Steel	316SS, 304SS, 420SS	Various polymers, Ag	Dielectrics, Conductors	Heaters
	Titanium	—	Au	Conductor	Sensing
	Silicon	—	Various polymers, Ag	Dielectrics, Conductors	Sensing
Ceramic	Alumina	—	Ag, Au, Pd, Pt	Conductor, Capacitor,	Electrocauterization, heaters, sensors
	Silica	Pyrex,® Glass, Quartz	Ag, Various polymers	Conductors, Protective layers	Heaters

*All registered trademarks and tradenames are the property of their respective owners.

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