

PASSIVE COMPONENTS SHORTFORM





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RESISTORS

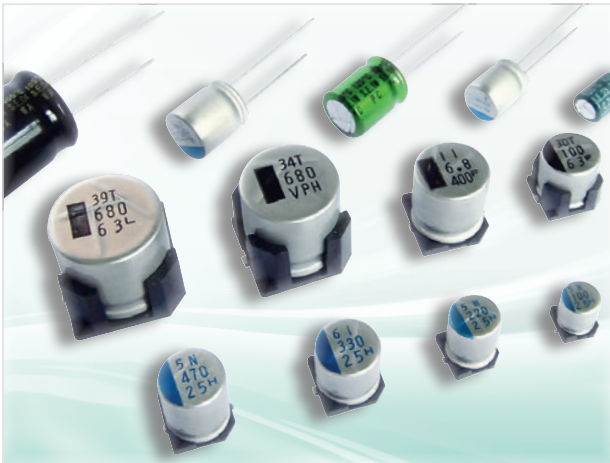
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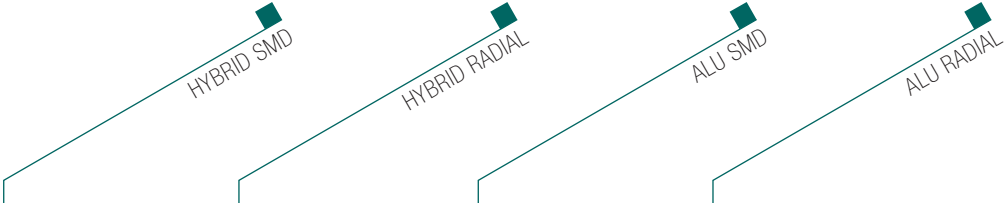


SMD ELECTROLYTIC & HYBRID CAPACITORS

Sun Electronic Industries (SEI) develops and produces aluminium electrolytic and polymer hybrid capacitors in high-grade for many decades. The manufacturer focuses on efficient capacitors in SMD technology and distributes those under the trademark SUNCON. The vast majority of these products are certified in accordance to AEC-Q200 and are manufactured with standards of TS 16949 / IATF 16949.



- ### FEATURES
- High rated ripple current in small size
 - Low ESR down to 10 mOhm
 - Stable ESR at low temperature
 - High reliability (in case of failure, typ. "open mode")
 - Wide temperature range (105° - 150°C)
 - All SMD parts from Ø 8 mm to 16 mm in anti vibration version available



GENERAL PARAMETERS				
Voltage range	6.3 to 125 V	6.3 to 100 V	4 to 400 V	4 to 450 V
Capacitance range	6.8 to 1000 uF	10 to 560 uF	0.47 to 12000 uF	0.47 to 15000 uF
Temperature range	-55°C / +150°C	-55°C / +125°C	-55°C / +150°C	-55°C / +125°C
Endurance	1.000 to 10.000 h	2.000 to 10.000 h	1.000 to 10.000 h	1.000 to 12.000 h
ESR	14 to 150 mΩ (100 kHz)	14 to 100 mΩ (100 kHz)	0.06 to 5.0 Ω (*)	12 to 170 mΩ (**)
Ripple current	Up to 4340 mA (100 kHz)	Up to 4340 mA (100 kHz)	Up to 2260 mArms (***)	Up to 3680 mArms (****)
Size	Ø 6.3 mm to 10 mm	Ø 6.3 mm to 10 mm	Ø 4 mm to 18 mm	Ø 4 mm to 18 mm
Height	4.5 mm to 12.5 mm	7.2 mm to 11.5 mm	3.9 mm to 21.5 mm	5 mm to 35.5 mm

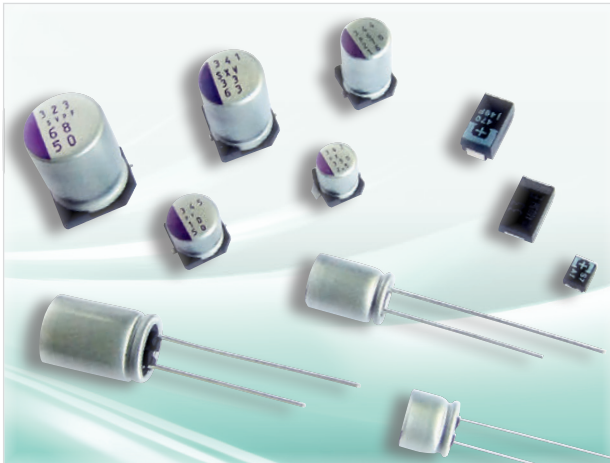
(*) 0.06 Ω: 100 kHz / 20 °C
 5.0 Ω: 100 kHz / -40 °C
 (**) 100 kHz / 20 °C

(***) 2260 mArms : 100 kHz / 105 °C
 (****) 3680 mArms : 10~200 kHz / 105 °C

POLYMER CAPACITORS



Panasonic is a leading global manufacturer of various capacitor technologies. Parallel to their standard electrolytic capacitors, Panasonic sells solid polymer capacitors under the trademark OS-CON and POSCAP (former Sanyo) and has in the recent past added SP-CAPs to their line-up. These capacitors are coming to use in various applications in telecommunication, IT, building automation and industry divisions.



- FEATURES**
- Super low ESR down to 3 mOhm
 - High ripple current up to 7 Arms
 - 20 A Rush current
 - Available in chip and can housing
 - High reliability and long lifetime (80,000 hrs @ 85°C)
 - Automotive grade products available for improved series (certified by AEC-Q200 / TS16949)

GENERAL PARAMETERS			
Voltage range	2 to 35 V	2 to 100 V	2 to 35 V
Capacitance range	3.9 to 1500 uF	3.3 to 2700 uF	2.2 to 560 uF
Temperature range	-55°C / +125°C	-55°C / +125°C	-55°C / +125°C
Endurance	1.000 h @ 125°C	2.000 h @ 125°C	1.000 @ 125°C
ESR	Down to 5 mΩ	Down to 5 mΩ	Down to 3 mΩ
Ripple current	up to 4.4 A	up to 7 A	up to 10.2 A
Size	2.0 x 1.25 mm to 7.3 x 4.3 mm	Ø 4 mm to 10 mm	7.3 mm x 4.3 mm
Height	0.9 mm to 4.0 mm	5.5 mm to 13 mm	1.1 mm to 2 mm

MIDDLE SIZE SERIES & CUSTOMISED DESIGN CAPCITORS



FTCap is a German manufacturer specialised in aluminium electrolytic and film capacitors in small and medium series. Since 1948 "Fischer & Tausche" stands for quality which is ensured through the ISO 9001:2008 certification as well as the auditing according to VDA 6.3. (TS 16949 certification is in progress). They benefit from their experience of the last 65 years which guarantees an innovative power, a wide range of products and an unique expertise in developing client-oriented product solutions.



- ### FEATURES
- Focus on individual developments and customised design
 - Niche market, middle size series
 - Exclusively manufactured in Germany and Switzerland
 - Owner of various patents
 - One of the leading European manufacturer of capacitors
 - Focus on high reliability, high innovation and flexibility

ELECTROLYTIC CAPACITORS

FILM CAPACITORS

GENERAL PARAMETERS		
Voltage range	10 to 500 V or customised	Up to 120 kV or customised
Capacitance range	4.7 µF to 2 F	1 pF to 1 F
Temperature range	-40 / +135 °C	-40 / +105 °C
Endurance	Up to 25.000 h	Up to 100.000 h
ESR	1 m Ω	Customised
Ripple current	Customised	Customised
Size	10 to 90 mm	Customised
Height	25 to 230 mm	Customised

THIN FILM PRECISION & METAL FOIL CURRENT SENSE CHIP RESISTORS



Susumu Co. Ltd is world wide recognised as an expert in thin film chip resistors and metal foil current sense chip resistors with unmatched reliability and stability. By their more than 50 years long experience, Susumu successfully adopted technologies like thin-film deposition and micro photo etching (photolithography). These core processes enable Susumu to design various resistance pattern on the chip to offer special purpose chip resistors and customised voltage divider networks.



HIGHLIGHTS

- **RG Series:** **high** reliability thin film chip resistors, often used in industrial and automotive applications.
- **URG/LRG Series:** **ultra** reliability thin film chip resistors for highest precision ($\pm 0.01\%/\pm 1\text{ppm}$) and stability (drift $< \pm 0.25\%$ after 10.000 hours of stress test), often used in analog measurement applications.
- **PRG/HRG Series:** precision resistors with increased power rating with short-side (HRG) and long-side (PRG) terminals, often used as gate resistor and in snubber circuits.
- **RM Series:** resistor networks with matching tol. as low as $\pm 0.01\%$ and matching TCR as low as $\pm 1\text{ppm}$, wide resistance range of 100 Ohm - 500 kOhm. Often used as voltage divider in custom configurations.

	FEATURE	TECHNOLOGY	PURPOSE	PACKAGES	TOLERANCE %	TCR PPM/K	SERIES
GENERAL PARAMETERS							
Ultra high reliability	Thin film	Analog measurement	0603 - 2512	0.01 - 0.1	1 - 2	URG, LRG	
Economical	Thin film	General purpose	0201 - 1210	0.1 - 1	25 - 100	RR	
High power	Thin film	Gate / snubber	0804 - 2512	0.1 - 0.5	25 - 50	PRG, HRG	
Anti surge	Thin film	Melf replace	0805 - 2010	0.1 - 0.5	10 - 25	MRG	
Gold contacts	Thin film	High temperature	0402 - 0805	0.01 - 0.5	1 - 25	RGA, RMA	
High reliability	Thin film	Automotive, industrial	0402 - 1206	0.05 - 0.5	5 - 100	RG	
Trimmable	Thin film	For trimming incustomer site	0201 - 0805	20	25 - 100	RT	
Networks	Thin film	Voltage divider	0805 - 2512	0.01 - 0.5	1 - 25	RM	
Jumper	Thin film	High current jumper	0603 - 1206			YJP	
Non-magnetic	Thin film	To use in magnetic field	0603 - 1206	0.05 - 0.5	5 - 50	NRG	
Sound	Thin film	Audio applications	0402	0.1 - 0.5	25	RS	
High frequency	Thin film	Attenuator, splitter, terminator	0402 - 1712			PAT, PXV, PS, PCS	
Low Ohm	Metal foil	Current sense resistor	0402 - 5930	0.5 - 5	50 - 150	KRL	
Low Ohm	Thin film	Current sense Resistor	0603 - 3008	0.5 - 5	50 - 800	RL, PRL	
Low Ohm	Metal foil	Precision shunt	2512	0.5	5	SHR	
Fusible	Thin film	Fusing resistor	0603 - 1206	0.5 - 0.1	25 - 50	FRG	

SPECIAL PURPOSE THICK FILM RESISTORS



Prosperity Dielectrics Co. Ltd (PDC) is a Taiwanese manufacturer of specialty thick film chip resistors since 1990. Specialty chip resistors are passive components that are designed for the use at special purposes. PDC is focused only on these specialties and can offer excellent performance with competitive price and reasonable lead times. Highlights are the FPS (high-power & anti-surge type) and FVS (safety resistor with UL listing) series.

FEATURES

- Designed in these technologies: metal paste, metal strip, and thick film
- Optimised for these purposes: current sensing, high voltage, safety, precision, high power, anti-surge, high resistance, trimmable, non-magnetic and anti-sulfurate

APPLICATIONS

- Power supplies: such as AC/DC, DC/DC, inverter, SMPS, charger, ...
- Communication: modem / router, Lan / Wlan, tuner, phones, ...
- Industrial electronics: such as electronic controller units, automation equipment, ...
- Special: such as automotive, medical, measurement, military, ...

TYPE

SERIES

RES. RANGE

TOLERANCE

TCR [PPM/K]

POWER RATING

SIZE

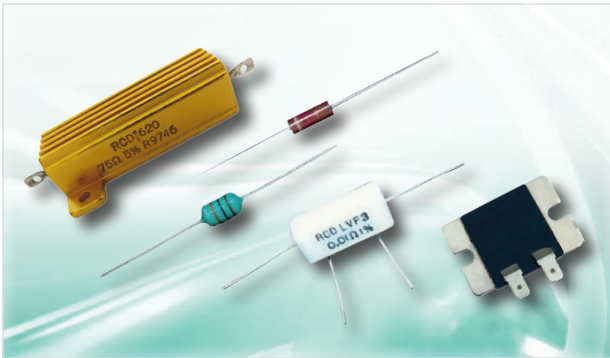
ELECTRICAL SPECIFICATION

TYPE	SERIES	RES. RANGE	TOLERANCE	TCR [PPM/K]	POWER RATING	SIZE
Anti-surge	FNF	1 ~ 1 MΩ	±5 %, ±10 %, ±15 %, ±20 %	±100	1/10 ~ 1 W	0603 ~ 2512
Anti-surge & high power	FPS double / triple power	0 Ω; 1 Ω ~ 1 MΩ	±1 %, ±5 %	±100 ~ ±200	1/8 ~ 2 W	0603 ~ 2512
Array	FCF-array	0 Ω; 10 Ω ~ 1 MΩ	±1 % ~ 5 %	±200 ~ ±300	1/16 ~ 1/10 W	4P2R ~ 16P8R
Automotive	FWF	0 Ω; 1 ~ 10 MΩ	±1 %, ±5 %	±100 ~ ±200	1/16 ~ 1 W	0402 ~ 2512
Current sensing – thick film	FCF-L	510 mΩ ~ 910 mΩ	±1 %, ±5 %	±200 ~ ±300	1/10 ~ 1 W	0603 ~ 2512
Current sensing – metal strip	FMF / FMF06	1 m ~ 100 mΩ	±1 %, ±2 %, ±5 %	±70 ~ ±100	1/2 ~ 5 W	1206 ~ 5931
Current sensing – metal paste	FBF	10 mΩ ~ 910 mΩ	±1 %, ±5 %	±100 ~ ±400	1/8 ~ 2 W	0603 ~ 2512
High power – low resistance	FPF-L / FPF25 Triple	50 m ~ 910 mΩ	±1 %, ±5 %	±100 ~ ±250	1/4 ~ 3 W	0603 ~ 2512
High power – high resistance	FPF double / triple power	0 Ω; 1 Ω ~ 10 MΩ	±1 %, ±5 %	±100 ±150 ±200	1/8 ~ 3 W	0603 ~ 2512
High ohmic	FHF	11 M ~ 100 MΩ	±1 %, ±5 %	±200	1/10 ~ 1/4 W	0603 ~ 1206
High voltage	FVF	100 K ~ 100 MΩ	±1 %, ±5 %	±100 ~ ±200	1/10 ~ 1 W	0603 ~ 2512
High-voltage with safety certificate (UL file)	FVS	100 KΩ ~ 100 MΩ	±1 %, ±5 %	±100 ~ ±200	1/10 ~ 1 W	0603 ~ 2512
Non-magnetic	FGF	0 Ω; 1 ~ 10 MΩ	±1 %, ±5 %	±100 ~ ±200	1/10 ~ 1/4 W	0603 ~ 1206
Trimmable	FTF	10 ~ 1 MΩ	0 ~ -10 % (Z); 0 ~ -20 % (Y); 0 ~ -30 % (X)	±100	1/10 ~ 1 W	0603 ~ 2512

SPECIAL PURPOSE RESISTORS



RCD COMPONENTS INC. has been a key manufacturer of standard and custom Resistors, Capacitors, Coils, Delay Lines for over 40 years. RCD's USA plant is the home of the SWIFT™ program, and also specializes in military, aerospace and custom/specialty products. Caribbean and Asian facilities are geared for medium to high volume production, helping to ensure the industries most competitive pricing.



SWIFT™

- Unique delivery program of RCD for faster production
- Extra manufacturing line reserved for urgent demands
- Short lead time is dependant on type, tolerance, quantity & price adder

Contact us for details!

PICTURES

FEATURE

TECHNOLOGY

SMD

THT

GENERAL PARAMETERS

	Film and foil resistors	Thick film, thin film, power film, metal film, carbon film, melf, metal foil, metal oxide	MC, MCT, BLU, MPF, MGP, MHM, MCF	PW-M, PV-M, PWV-M, HP, HM, VS, PMF, MF, GP, GPS, FP.FPS, RSF, RMF, MG, FS, CF, MFA
	Wirewound resistors	Melf, moulded, gullwing, silicone coated, aluminum housed, ceramic cased, tubular, edgewound, flat	MW, MWM, PC451G	SA, MA, PC, Q, 100, 200, RW, 600, PW, PV, PVH, PWV, PWLL, PWH, T, EW, FW, FWE
	Current sense resistors and shunts	Molded, chip, 4 terminal, metal plate, ceramic case, open-air, DCshunt	MWM-L, ML, SF	PV, PVH, ULV, LVF, LVH, LOR, LV3, OA, SPM, SVM, SHM
	High voltage / High megaohm resistors	Chip, gullwing, axial, tubular, radial, screw	HR, SRH, BC-G	RG, RH, RP, SR, BC, UHV
	Composition and Surge resistors	Molded, high surge, high pulses, carbon, carbon composition, wire wound	PRM, option P	PR, CC, CFZ, PCN
	Zero ohm jumpers	Chip, array, stamped, axial, networks	ZC, ZCF, ZN, ZMN, Z1206	CJ, ZJ, Z
	Networks, arrays, hybrids IPC's	Chip, molded, LTCC, custom, SIP	CN, SMN, SMN16, DLN	DSN, DDN, CP, C, CL, RC, CSS, VDS
	Heat sink resistors	Wirewound, power film, TO style	MPD, MP-G	600, MP, HDP, CM300
	Fusible resistors	Axial, radial, ceramic encased	FC, MBW	RW-FF, PW-FF, FR, BW, TF, TFV, LF2
	Others	Resistance standards, custom resistors		A1, A2

HIGH VOLTAGE & HIGH OHMIC RESISTORS



E&C is a maker of resistors with high ohmic values in the range of Mega Ohm to Peta Ohm. Their resistors are classified in the metal glaze resistor of thick film type. These resistors are widely used as key-parts in industrial equipment such as physical and chemical measuring instruments, X-ray apparatuses, electron microscopes, and other instruments. E&C can supply various types of resistors such as surface mount type, lead type, for high power and high voltage, for high vacuum or voltage divider. E&C has the capability to produce various specialty and custom products to meet even the most advanced requirements.



- FEATURES**
- High Voltage up to 750 kV
 - High Ohmic Values up to 1 Peta Ohm
 - Very low noise, High Accuracy, Best Stability
 - HC type with Au finish for bonding available

- FURTHER PRODUCTS OF E&C:**
- Resistor Box
 - High Voltage Probe
 - Measuring Instruments

PICTURES	TYPE	SERIES	FEATURE	SIZE / POWER	RANGE
GENERAL PARAMETERS					
	Surface mount	HC	Chip standard	0402 ~ 2512	1 MΩ ~ 150 GΩ
		HP	Chip precision	0402 ~ 1206	1 MΩ ~ 100 MΩ
		SM	Chip plate	3.2x1.6 ~ 25.5x5	500 kΩ ~ 1 GΩ
		BT	Divider	2512 ~ custom	1 MΩ ~ 100 MΩ
	Lead type	RH	Axial standard	1/8 W ~ 16 W	10 kΩ ~ 10 GΩ
		RU	High precision	1/4 W ~ 3 W	100 kΩ ~ 100 MΩ
		RH ultrahigh	Ultrahigh ohm	1/4 W ~ 3 W	1G Ω ~ 10 TΩ
		RHA	Hermetically sealed	1 W ~ 2.5 W	100 kΩ ~ 10 GΩ
		RG	High vacuum	1/4 W ~ 2 W	100 kΩ ~ 100 MΩ
		LM	Precision plate	0.15 W ~ 1 W	500 kΩ ~ 1 GΩ
		BT	Voltage divider	n/a	1 MΩ ~ 1 GΩ
		FP	Plate	1/2 W ~ 4 W	10 kΩ ~ 1 GΩ
FP anti pulse	high-voltage load	6 W	10 MΩ ~ 10 GΩ		
	Power type	HVP	High power tubular	5 W ~ 250 W	50 kΩ ~ 5 GΩ

INDUCTIVE COMPONENTS



ABC Taiwan Electronics Co. is characterised by a very large product portfolio with an excellent price/performance ratio. High flexibility which is based on semi automatic processing makes it possible to convert customised requests into serial products even for medium quantities. ABC has more than 35 years of experience and maintains five factories in Taiwan, China and Malaysia.



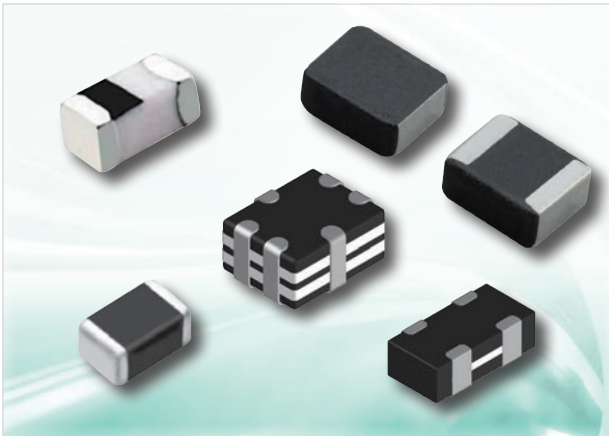
- ### NEWS
- **DP Series:** high efficient chip inductors using powder of amorphous core metal alloy and flat wire spring coil with a winding.
 - **TPI Series:** high current SMD inductors, applying powderised ferrite, mixed with epoxy, applied on the winding area for EMI shielding.
 - **ASF Series:** common mode line filter with gold terminals for automotive can bus, flexray and ethernet applications

PICTURE	FEATURE	SHAPE	SERIES	SPECIALTY / PURPOSE
GENERAL PARAMETERS				
	Non shielded SMD power inductor	Round, rectangular, square, oval	SR, ESR, BR, CB, SQ, SB	General purpose
	Semi shielded SMD power inductor	Round, square	TPI, RN, SN	Semi shielded
	Shielded SMD power inductor	Octagonal, rectangular, square, oval	SH, DH, QS, SS, CS, BS, CU, TPC, SU	Plastic, metal or ferrite base
	Iron powder high current inductor	Square	HP, CIP, HC, HE, DP	High current
	Shielded SMD double choke	Square	BF, SF	Sepic
	SMD common mode choke	Diverse	CF, SF, HDC, PWC	EMI / EMC
	Through hole inductors	Drum core toroid & others	AA, RB, RC, PA, TR, TB, UF	General purpose
	Chip inductor	0201-1210	CM, CC, LPI, MH, MS	Networking applications
	RF inductor	Chip 0402 - 1210	SW, SWI, HCI	High frequency
	Chip ferrite bead	Chip 0402 - 0805	MB, MZ, MU, SM	EMI/EMC

CHIP INDUCTORS, FILTERS, BEADS



INPAQ TECHNOLOGY CO., LTD. is one of the world leader in RF components, Integrated Passive Components and Circuit protection (V/I) devices. Additionally, Inpaq offers full, custom testing services (ex. certifications, conformity) for customers in their laboratories. Inpaq products are QS9000, ISO9001, ISO14001 and IECQ certified since 1999. Selected items are certified by AEC-Q200 and suitable for automotive applications.



STANDARD CAPABILITY FOR PASSIVE COMPONENTS

- Wire winding
- Multilayer
- Thin film
- Molding

FURTHER PRODUCTS OF INPAQ

- RF Antenna
- Circuit Protection

PICTURE	GROUP	SERIES	FEATURE
GENERAL PARAMETERS			
	Power Inductor	WIP P, S, Y Type	Wire Wound Metal Molding
		WPA P, S Type	Wire Wound Metal Molding – for Automotive
		MIP P, W Type	Multilayer
		MPA	Multilayer – for Automotive
	HF Inductor	MCI	Chip Ceramic Inductor
		MFI	Chip Ferrite Inductor
		WCI	Chip Wire Wound Inductor
	Bead	MCB, MCB S type	Regular
		MCB H type	For High Speed
		MHC, MHC P type	High Current
		MGB	High Speed for GHz Band
	Filter	MCB / MHC W type	Automotive
		TNF	Thin Film
		TNFE	Thin Film + ESD
		MCM / HCM	Multilayer
		MCM W	Automotive
HCE	Filter + ESD		

OFFICES IN EUROPE

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Spain

Italy

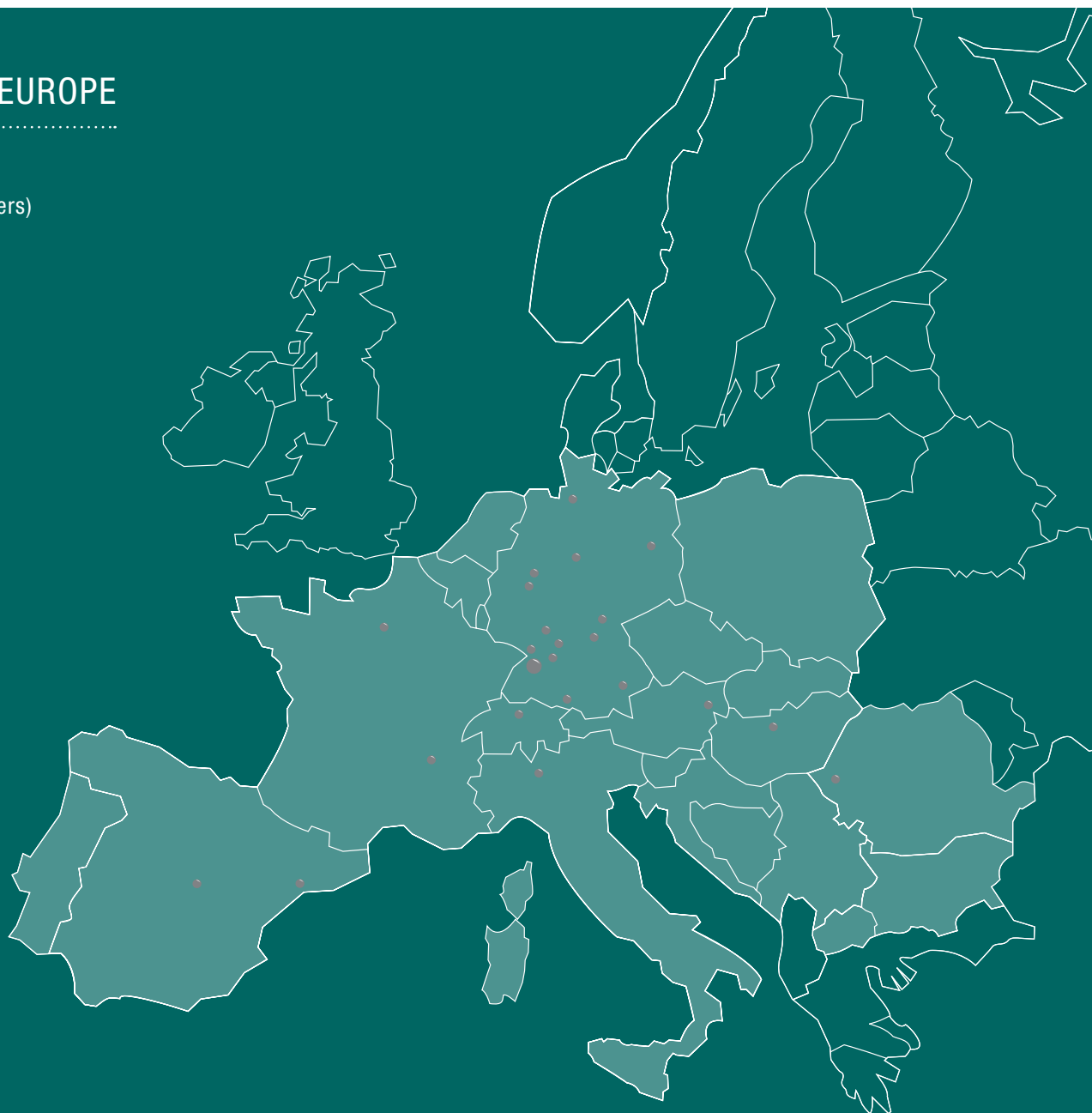
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