



ENGINEERED CONDUCTIVE MATERIALS

**Stretchable
Soft**



**Printed
Electronics**



Biosensors



**Low Cost Film
Applications**



Surface Mount



Heaters



Membrane Switch/Printed Electronics

TYPICAL APPLICATIONS

- Membrane switch
- Surface mounting
- Sensors
- Capacitive touch

Product Designation	Description	Typical Application/ Benefit	Application Method	Electrical Resistivity $\Omega/\square/25\mu\text{m}$
SILVER CIRCUIT TRACES				
CI-1001	Silver-vinyl	PET film circuitry/ low cost	Screen print	<0.015
CI-1036	Silver-urethane, durable, low Ω	PET film or soft substrates/ creasable, stretchable	Screen print	<0.010
CI-1091	Silver-epoxy	PET film circuitry/ halogen-free	Screen print	<0.020
CI-1028	Silver-polyester	PET film circuitry/ low temp/fast dry, fine line	Screen print	<0.020
CARBON RESISTORS, CONTACT PADS				
CI-2001	Carbon-vinyl	Top coat contact pads/blend with CI-1001	Screen print	<20
CI-2069 series	Carbon-epoxy	Printed resistors/ stable linear Ω , halogen-free	Screen print	100, 1000 10,000, 100,000
CI-2042	Carbon-vinyl	Printed top-coat, jumpers/low Ω	Screen print	<10
CI-5001	Nickel-vinyl	Printed top-coat, jumpers/low Ω , abrasion resistant	Screen print	<10
DIELECTRIC INSULATORS				
DI-7502	Dielectric, UV cure	Protect CI-1001 and build jumper path, low stress, excellent adhesion	Screen print	>1,000 Mega Ω
DI-7542	Dielectric, UV cure	Protect CI-1036 on PET, build jumper path, durable, creasable	Screen print	>1,000 Mega Ω
DI-7548	Dielectric, UV cure	Protect CI-1036 on PET or stretch film, build jumper, stretchable	Screen print	>1,000 Mega Ω
NOVEL MATERIALS				
DI-7801	Pressure sensitive adhesive, UV cure	Printed PSA on PET or PC film/high peel strength, clear	Screen print	>1,000 Mega Ω
DI-7506	Printed spacer, UV cure	Thick film build on PET film/circuitry insulation	Screen print	>1,000 Mega Ω
CI-1093	Silver-epoxy for ITO film	Excellent adhesion and stress compatible	Screen print	<0.020
CI-1016	Silver for polycarbonate film	Excellent adhesion, stress compatible	Screen print	<0.020

Surface Mount Adhesives

Product Designation	Description	Typical Application/ Benefit	Application Method	Electrical Resistance $\Omega/\square/25\mu\text{m}$
CA-188-2	SMT Ag epoxy, one-part	Attach SMD/fast low temp cure	Needle or jet	0.0007 $\Omega\text{-cm}$
UF-1571	SMT staking compound, one-part	Attach SMD/ compatible with CA-188-2	Needle or jet	>1,000 Mega Ω
DB-1561	SMT Ag epoxy, two-part	Attach SMD/low temp cure, fine needle dispense	Needle	0.003 $\Omega\text{-cm}$
UF-9526	SMT staking compound, one-part	Attach SMD/ compatible with DB-1561	Needle	>1,000 Mega Ω
EC-9519	SMT encapsulant, UV cure	Protect SMT joint/PET or PC adhesion, low stress	Needle or jet	>1,000 Mega Ω

Stretchable/Smart Fabric

TYPICAL APPLICATIONS

- Wearable technology
- Soft, pliable electronic interface
- Capacitive sensing
- TPU film compatible
- eTextile



PRODUCT	FEATURE	CUSTOMER BENEFIT
CI-1036 Silver/Proprietary resin	Durable, stretchable, low ohms	Integrate electronics into user-friendly fabrics
CI-2051 Carbon/Proprietary resin	Stretchable silver top coat, excellent adhesion, low temp	Protect silver at contact points, cost savings on new
DI-7540 UV-cure insulator	Durable, stretchable, compatible	Protect silver circuitry and maintain stretch properties
CI-4040 Silver/Silver Chloride/Proprietary resin	Durable, stretchable, chloride ions	For bio-sensing in Smart Fabrics

Biomedical Sensors

TYPICAL APPLICATIONS

- ECG/EKG/EEG pads
- Drug delivery (iontophoresis) patches
- TENS
- Glucose sensors
- Cosmetic patches
- Soft, pliable

Product Designation	Description	Typical Application/ Benefit	Application Method	Electrical Resistivity $\Omega/\square/25\mu\text{m}$
CONDUCTIVE CIRCUITRY				
CI-1001	Silver-vinyl	Circuit traces and electrodes/low cost	Screen print	<0.015
CI-1036	Silver-urethane, durable,	PET or soft film/ creasable, stretchable	Screen print	<0.010
CI-1091	Silver-epoxy	Circuit traces and electrodes/ halogen-free	Screen print	<0.020
SILVER/SILVER CHLORIDE ELECTRODES				
CI-4001	Ag/AgCl (45/55%) vinyl	Drug delivery electrode/high AgCl %	Screen or pad print	<0.500
CI-4002	Ag/AgCl (83/17%) vinyl	ECG, EEG or defib pad/ high solids	Screen print	<0.050
CI-4025	Ag/AgCl (80/20%) vinyl	ECG or EEG pad/ low cost	Screen print	<0.050
CI-4047	Ag/AgCl (80/20%) polyester	Withstands harsh hydrogels and solutions	Screen print	<0.200
CI-4040	Ag/AgCl (80/20%) urethane	ECG, EEG or defib pad/ stretchable	Screen print	<0.050
CARBON ELECTRODES				
CI-2042	Carbon vinyl	Reference electrode or trace/highly conductive	Screen print	<10
CI-2057	Carbon proprietary	Amperometric glucose sensor/ active surface	Screen print	<50
CI-2067	Carbon proprietary	Amperometric glucose sensor/ active surface	Screen print	<25
CI-2058	Carbon proprietary	Immunosensor sensor/active surface	Screen print	<50
NOVEL MATERIALS				
CI-5002	Zinc vinyl	Zinc anode/create carbon-zinc battery cell for drug delivery	Screen print	>1,000 Mega Ω

Heaters

Product Designation	Description	Typical Application/ Benefit	Application Method	Electrical Resistivity $\Omega/\square/25\mu\text{m}$
SILVER CIRCUIT TRACES OR BUSS LINES				
CI-1001	Silver-vinyl	PET film circuitry/ low cost	Screen print	<0.015
CI-1091	Silver-epoxy	PET film circuitry/ halogen-free	Screen print	<0.020
CARBON HEATING ELEMENTS				
CI-2070 / CI-2071 blends	Carbon-proprietary	Heater elements/blend to target, stable resistance	Screen and rotary screen print	50 12,000
CI-2068	PTCR	Self regulating heaters/compatible with PET or soft substrates	Screen print	11,000
CI-2042	Carbon-vinyl	Heater element/stable resistance	Screen print	<10
NOVEL MATERIALS				
CI-1093	Silver-epoxy for ITO film defrosters	ITO-sputtered film/excellent adhesion and stress compatible	Screen print	<0.020

Low Cost Film Applications

- Excellent adhesion to low cost film
- Dry as low as 50°C

Product Designation	Description	Typical Application/ Benefit	Application Method	Electrical Resistivity $\Omega/\square/25\mu\text{m}$
SILVER CIRCUITRY				
CI-1095	Silver-proprietary	Low temp 60C cure for thinner low-cost film	Screen print	<0.025
CARBON ELEMENTS				
CI-2062	Carbon-proprietary	Low temp 60C cure for thinner low-cost film	Screen print	<50
DIELECTRIC INSULATORS				
DI-7548	Dielectric, UV cure	Protect silver and create multi-layer	Screen print	>1,000 Mega Ω



Company Profile:

Engineered Conductive Materials is a brand name owned by Engineered Materials Systems, Inc (EMS). The ECM technology focus is electronic **circuit fabrication** which is complimented by EMS's **circuit assembly (SMT)** technology. Our products are thoroughly tested for compatibility with various layers in the application to ensure superior performance and endurance. EMS solves difficult application problems while fostering customer relationships with loyalty, technology, and superior customer service.

ECM Product's Applications:

- Membrane touch switch
- Medical sensors and electrodes
- Capacitive Touch Switches
- Printed heaters
- Stretchable, wearable electronics

EMS Services:

EMS has a seasoned staff of polymer chemists, formulators and application engineers to assist with your most difficult application problems.

EMS has a full compliment of laboratory and analytical equipment to develop inks and adhesives and solve application challenges.



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