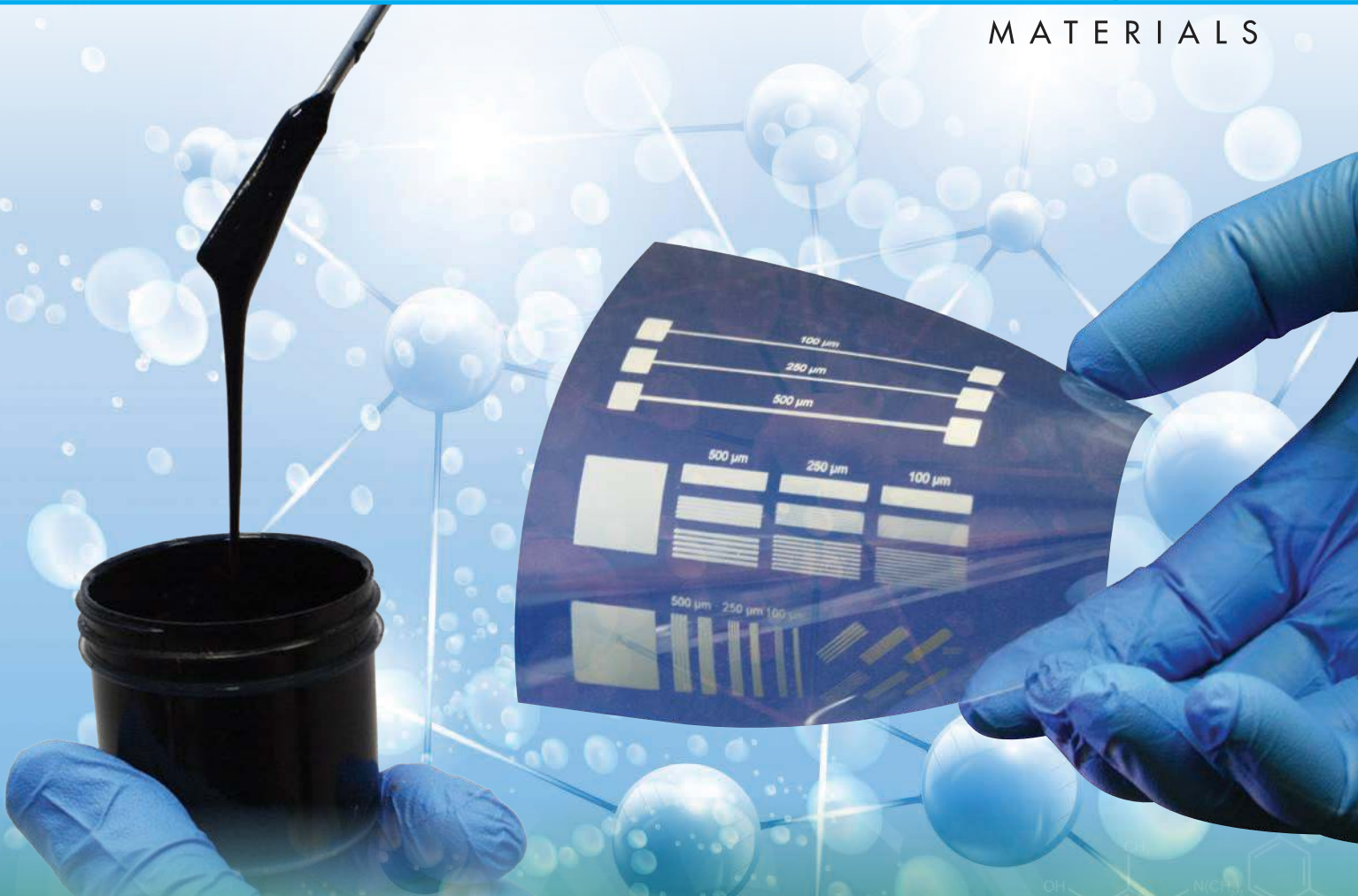


DYCOTEC

MATERIALS



Products and Services Overview

Introduction to the Company

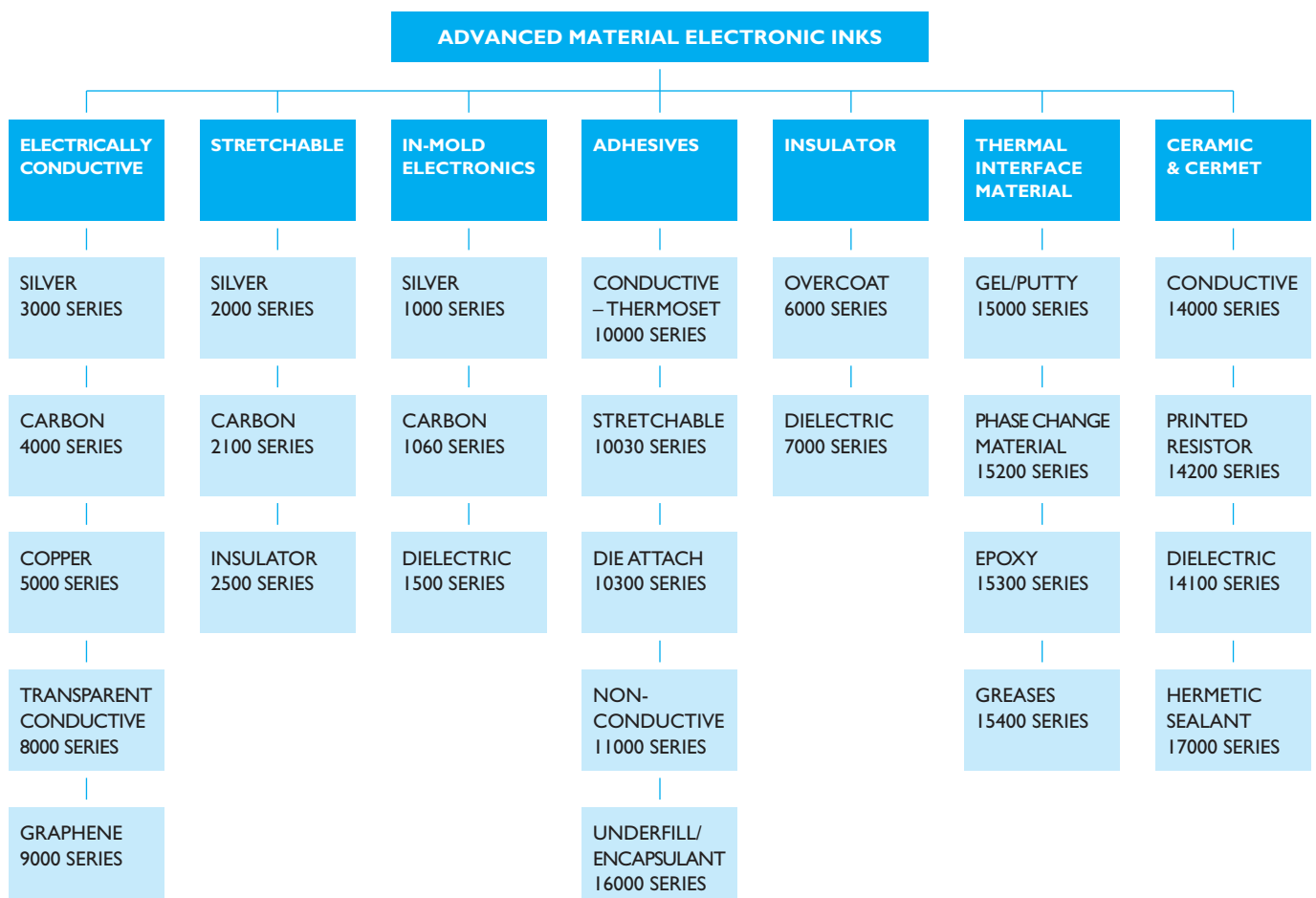
Dycotec Materials is an ISO:9001 certified advanced materials company that develops and manufactures electrically conductive, adhesive, insulator, overcoat and thermal interface materials. We sell over 100 printed electronic materials globally from sample to high volume. Samples can be purchased directly from our on-line shop and shipped within 5 days. We also supply substantially more materials that have been developed specifically to our customer needs.

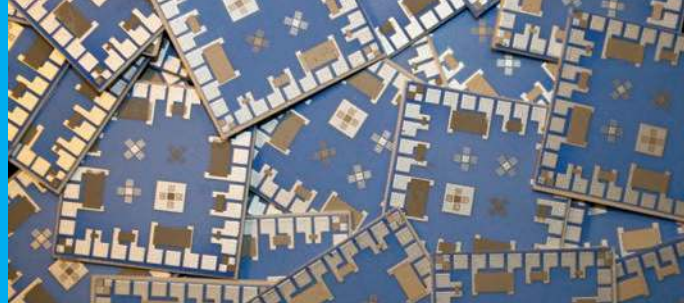
At our purpose built printed electronics 21,000 ft² Technology Centre in the UK, our materials are subjected to rigorous testing standards to ensure approval in applications such as wearables, IoT sensors, In-Mold Electronics, solar cell, automotive, aerospace, medical, semiconductor and display.

Our highly experienced and innovative technical team provide a highly flexible and rapid response for customer developments. We work closely with our customers handling a variety of projects supporting from proof of concept studies and testing suitable material systems through to bulk volume material supply.



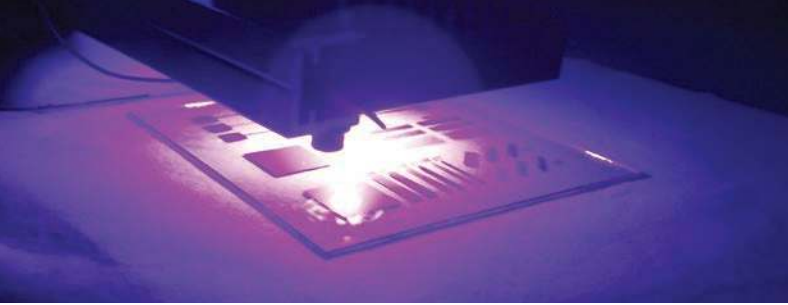
Product Overview





Product Range

Product Category	Product Series	Description	Example Applications	Deposition Process
IME	DM-SIP-100X	Silver conductive	In-Mold Electronics	Screen
	DM-CAP-1060S	Carbon conductive	In-Mold Electronics	Screen
	DM-INS-1500	Cross-over Dielectric	In-Mold Electronics	Screen
STRETCHABLE	DM-SIP-2000	Silver conductive	Wearables, medical, automotive	Screen
	DM-SCP-2000	Silver/carbon conductive	Wearables, medical, automotive	Screen
	DM-CAP-2100	Carbon conductive	Wearables, medical, automotive	Screen
	DM-INS-2500	Insulators	Wearables, medical, automotive	Screen
SILVER	DM-SIP-3000	Low temperature micro flake and micron powder silver pastes	Display, thin-film PV, smart glass, heaters, automotive, aerospace	Screen
	DM-SIP-3100	High viscosity Nanosilver pastes	Thin-film PV, heaters	Screen
	DM-SIJ-3200	Nanosilver inkjet	OPV, Display, sensors	Inkjet
	DM-SIJ-3300	Nanosilver Aerosol printing	Semiconductor, medical	Aerosol jetting
SILVER CHLORIDE	DM-SIP-3400	Silver and silver chloride pastes	Biosensors	Screen/syringe
CARBON	DM-CAP-4100	High durability thermoset carbon pastes	Automotive	Screen
	DM-CAP-4300	Low temperature thermoset carbon pastes	Sensors	Screen
	DM-CAP-4400	Hydrophobic carbon pastes	Biosensors	Screen
	DM-CAP-4500	Flexible carbon paste	Medical, paper	Screen
	DM-CAP-4700	Carbon pastes for perovskites	Perovskite Solar Cell	Screen/syringe
COPPER	DM-CUI-500X	Light sintered nanocopper ink	PV, semiconductor	Inkjet
	DM-CUI-501X	Light sintered nanocopper ink	PV, semiconductor	Aerosol jetting
	DM-CUI-505X	Micron/Nano copper hybrid pastes	Automotive, semiconductor, PCB, PV	Screen
	DM-CUP-5080 & DM-CUP-5100	Nanocopper paste systems	Automotive, semiconductor, PCB, PV	Screen
OVERCOAT	DM-OCI-6000	Ink-jet printed overcoat	Sensors, display	Overcoat
	DM-OC-6020S	Thermoset overcoat	Automotive	Overcoat
	DM-OC-6031S	Transparent low temperature cure	Display, Touch Sensors	Overcoat
INSULATOR	DM-INI-7003	High epoxy content	PV, display	Inkjet
	DM-IN-7011S	UV curable thermoset	Industrial	Screen
	DM-IN-7021S	Thermally cured thermoset	Heaters	Screen
TRANSPARENT CONDUCTIVE	DM-SNW-8012S	Transparent conductive	Display, Touch sensor; heaters	Screen
GRAPHENE	DM-GRA-9000	Single and few layer graphene	Sensors, heaters	Inkjet
	DM-GRA-9100	Carbon/graphene hybrid	Heaters, sensors, automotive	Screen
CONDUCTIVE ADHESIVE	DM-AS-10000	Epoxy thermoset conductive adhesive	Hybrid Printed Electronics	Syringe/screen/stencil
	DM-SAS-10000	Highly stretchable, flexible conductive adhesive	Wearables, In-Mold Electronics	Syringe/screen/stencil
	DM-SSA-10300S	Silver sinter die attach	Semiconductor assembly	Syringe/screen/stencil
NON-CONDUCTIVE ADHESIVE	DM-ADH-11001	Non-conductive adhesive	Sensors, hybrid printed electronics	Syringe/screen/stencil
PIEZORESISTIVE	DM-PIR-12000	Piezoresistive	Sensors	Screen
HIGH TEMPERATURE FIRED	DM-SIP-14000	Cermet pastes	Heaters, resistors, potentiometers	Screen
	DM-INS-14100	Dielectric and overglaze	Heaters, resistors	Screen
THERMAL INTERFACE MATERIAL	DM-TIM-15000	Gels/putties	Semiconductor; PCB Assembly, Automotive, Battery	Syringe
	DM-TIM-15200	Phase Change Material	Semiconductor; PCB Assembly, Automotive, Battery	Syringe/screen/stencil
	DM-TIM-15300	Thermoset epoxy	Semiconductor; PCB Assembly, Automotive, Battery	Syringe/screen/stencil
	DM-TIM-15400	Greases	Semiconductor; PCB Assembly, Automotive, Battery	Syringe/screen/stencil
ENCAPSULANT/ UNDERFILL	DM-UFL-16000	Underfill/Encapsulant for SMT component	Hybrid Printed Electronics	Screen
	DM-ENC-16200	Stretchable UV curable thermoset	Wearables	Screen
HERMETIC SEALANTS	DM-HMS-17000	UV cured, laser and high temperature fired sealants	PV, semiconductor	Screen/syringe



Tailored Material Service

The proliferation of printed electronics materials needed for new applications, deposition processes and flexible and stretchable substrates means that often standard products cannot be used. Dycotec works collaboratively with its customers to formulate material systems to meet their specification.

We have extensive facilities to develop material sets including:

- Laser Particle Analysis, Scanning Electron Microscopy, Optical Microscopy, Profilometry
- ICP-OES
- Thermogravimetric Analysis, Differential Scanning Calorimetry, ThermoMechanical Analysis
- FTIR, UV-VIS and fluorescence spectroscopy
- Suite of electrical and thermal characterisation tools
- Suite of Tensometer and hardness testing tools
- Surface Tensiometers, Contact Angle Analysis

Product Development Services

In many cases, Dycotec produce printed customer demonstrator products. To support our customer product developments, using our advanced materials systems, we have a dedicated process engineering team with a diverse range of skill sets including capabilities in electronics design, 3D CAD design and 3D printing. Fast prototyping lowers risk, increases the “printed electronics” learning curve and enables products to be rapidly evaluated significantly reducing the time to market.

Customer products can be readily prototyped with our extensive range of deposition and processing tools including:

- Three industrial screen printers and a host of manual printers
- Automated Surface Mount Assembly
- Automated x, y syringe deposition
- Die Placement Tools
- Industrial Inkjet printers
- Automated Spray systems
- Thermoforming
- Lamination
- UV cure, IR, convection and reflow ovens and belt furnaces

For more information, please contact:

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Development Process

**CUSTOMER MATERIAL
SPECIFICATION REVIEW**

**MATERIAL
DEVELOPMENT**

**DURABILITY/RELIABILITY
TESTING**

**PILOT
PRODUCTION**

**HIGH VOLUME
PRODUCTION**