Product Selector Guide
Printed Circuit Materials

PPG Industrial Coatings
Electronic Materials Group

Silver / Silver Chloride Inks

Product	Conductivity	Markets	Features	Application	Description
XSCL-611 65:35 Ag:AgCl	<0.050 Ω/Sq./ml	Defibrillator pads	• Excellent adhesion to polyester treated and untreated • Excellent abrasion resistance • Fine line printability	• Flat bed screen printable • Cure at 130°C for 10 minutes • Thinning and clean-up with carbitol acetate	A silver / silver chloride-based PTF ink with excellent screen residence time developed especially for medical applications

Silver Inks

Product	Conductivity	Markets	Features	Application	Description
XCSD-006N	<0.006 Ω/Sq./ml	RFID antennas, smart label applications	• Excellent adhesion to polyester treated and untreated • Excellent abrasion resistance • Fine line printability	• Rotary and flat bed screen printable • Cure at 150°C for 3 minutes • Thinning and clean-up with EB cellosolve acetate	A highly conductive PTF silver-based ink for printed circuits where conductivity is the main concern.
XCMS-009	<0.012 Ω/Sq./ml	Printed keyboards, RFID antennas and other printed circuitry with high cost sensitivity and higher performance	• Low silver content • Excellent adhesion to treated and untreated polyester film • Excellent flexibility • Increased durability • ASTM F1683-05	• Flat bed screen printable • Cure @ 150°C for 3 to 5 minutes • Cures @ lower temps in 10 to 15 minutes	A low-resistance thermoplastic-based PTF silver ink with exceptional durability and printability. Proprietary technology allows for low resistance with low Ag content resulting in excellent economic advantage. Provides increased adhesion to low-surface-tension substrates.
XCMSR-013	<0.013 Ω/Sq./ml	RFID antennas, smart labels, and other high-volume printed circuit requirements	• Formulated especially for rotary screen application printing • Excellent abrasion resistance • Fine line printability with excellent line definition • High speed printability (up to 60 meters/min is achievable)	• Rotary and flat bed screen printable • Cure at speeds of up to 60 meters/min @ 150°C in properly configured ovens • Thinning and clean-up with cellosolve acetate	A conductive thermoplastic-based PTF silver ink. It is designed for applications requiring high-speed printing of conductive circuits. This ink can provide extremely fine-line circuit traces with excellent edge definition.
XCMS-015	<0.015 Ω/Sq./ml	Touch screen applications and EL lamps	• Adhesion to treated and untreated polyester film • Adhesion to polycarbonate substrate	• Flat bed screen printable • Cure at 120°C for 10 minutes • Cures faster at higher temps • Thinning and clean-up with carbitol acetate	A conductive, thermoplastic, epoxy-based PTF silver ink for general use on printed circuits of all kinds.
XPCS-020	<0.020 Ω/Sq./ml	Smart labels, applications antennas	• Polycarbonate friendly • Excellent adhesion to polyester treated and untreated	• Screen / rotary screen and flexo printable • Cure at 130°C for 3 minutes • Thinning and clean-up with EB glycol ether	A highly conductive PTF silver-based ink designed for printing on polycarbonate and other solvent-sensitive substrates. Excellent flexibility and high-humidly printing tolerance.
XPCS-627	<0.020 Ω/Sq./ml	Smart labels, applications antennas	• Polycarbonate friendly • Excellent adhesion to polyester treated and untreated • Flat bed screen printable	• Cure at 130°C for 3 minutes • Thinning and clean-up with EB glycol ether	A highly conductive PTF silver-based ink designed for printing on polycarbonate, PVC and other solvent-sensitive substrates. Excellent flexibility and high-humidly printing tolerance in UHF antennas.

Silver Inks (continued)

Product	Conductivity	Markets	Features	Application	Description
XCMS-550	<0.007 Ω/Sq./ml	RFID antennas, smart label applications	• Excellent adhesion • Excellent flexibility • Economical	• Flat bed screen printable • Cures at 145°C for 5 minutes • Thinning and clean-up with carbitol acetate	A conductive, PTF silver ink providing excellent adhesion to difficult substrates and excellent flexibility at low silver loading. Especially formulated for UHF antennas
XPVS-390	<0.010 Ω/Sq./ml	Flexible photovoltaic applications	• Excellent contact resistance • Improved printability	• Screen / rotary screen printable • Cures at 130°C for 5 minutes • Thinning and clean-up with carbitol acetate	A highly conductive PTF silver-based ink with excellent Z conductivity and good X-Y current collection.
XTSS-578	0.00005 Ω cm @10 microns	Touch screen applications	• Excellent adhesion to ITO sputtered glass	• Flat bed screen printable • Cures at 130°C for 30 minutes • Thinning and clean-up with carbitol acetate	A highly conductive PTF silver-based ink designed to touch screen applications with line widths down to 100 microns
XPPS-682	<0.010 Ω/Sq./ml	Smart phones, pad printable antennas	• Pad printable	• Pad printable	Highly conductive, pad-printable silver for cell phone antennas.
XCSD-470	< 0.007 Ω/Sq./ml @25 microns	RFID, smart cards, and other printed antenna applications	• Excellent adhesion to polyester treated and untreated • Excellent screen residence time	• Rotary screen printable • Cures at 150°C for 3 minutes or 130°C for 15 minutes • Thinning and clean-up with EB acetate or carbitol acetate	Thermoplastic, polymer thick-film silver ink. Designed for use as a conductive circuit material. Engineered with improved cohesive strength for increased performance.
XPVS-670	<0.015 Ω/Sq./ml @25 microns	Flexible photovoltaic cell construction	• Excellent contact resistance • Excellent screen residence time • Improved adhesion to ITO • Improved flexibility	• Rotary / flat bed screen printable • Cures at 150°C for 3 minutes or 130°C for 15 minutes • Thinning with dibasic ester and clean-up with carbitol acetate or applicable screen wash	Thermoplastic, polymer thick-film silver ink. Engineered as a one-pack solution offering the end-user enhanced working times, lower wastage and increased performance.
XCMS-016	<0.016 Ω/Sq./ml @25 microns	Touch screen display circuitry, automotive switches, and other membrane switch applications where high durability and adhesion to difficult substrates is required	• Excellent adhesion to treated and untreated polyester, as well as ITO coated glass and PET • Excellent screen residence time • Syringe-dispensed, single-pack adhesive	• Screen printable • Cures at 150°C for 3 minutes or 130°C for 15 minutes • Thinning with EB acetate or carbitol acetate and clean-up with EB acetate	Thermoplastic, polymer thick-film silver ink. Designed for use as a conductive circuit material.

Silver / Carbon Inks

Product	Conductivity	Markets	Features	Application	Description
XCMB-594	<0.020 Ω/Sq./ml	Membrane switches, automotive applications	• Excellent adhesion to polyester treated and untreated • Excellent abrasion resistance • Fine-line printability • ASTM-1683-05	• Flat bed screen printable • Very good adhesion and flexibility • ASTM F1683-05 • Cures at 145°C for 10 minutes • Thinning and clean-up with cellosolve acetate	An economical, conductive thermoplastic polymer-based PTF ink for use on a wide variety of substrates with consistent performance
XCMB-590	<0.020 Ω/Sq./ml	Membrane switches, automotive applications, rotary screens	• Excellent adhesion to polyester treated and untreated • Excellent abrasion resistance • Fine-line printability • ASTM-1683-05	• Rotary screen printable • Very good adhesion and flexibility • ASTM F1683-05 • Cures at 145°C for 10 minutes • Thinning and clean-up with cellosolve acetate	An economical, conductive thermoplastic polymer-based PTF ink for use on a wide variety of substrates with consistent performance

Silver / Carbon Inks (continued)

XCMB-723	<0.020 Ω/Sq./ml	Membrane switches and other economically-sensitive printed circuitry	• Excellent adhesion to polyester treated and untreated • Excellent screen residence time • ASTM F1683-05	• Screen printable • ASTM F1683-05 • Cures at 130°C for 5-10 minutes • Thinning with butyl cellosolve acetate and clean-up with carbitol acetate	A thermoplastic-based polymer thick-film silver/carbon ink
XCuS-592	<0.450 Ω/Sq./ml @25 microns	Printed OPV and other cost-sensitive printed circuitry where environmental exposure is limited	• Excellent adhesion to treated and untreated polyester and ITO substrates • Excellent screen residence time	• Screen printable • Cures at 150°C for 3 minutes or 130°C for 15 minutes • Thinning with EB acetate or carbitol acetate and clean-up with EB acetate	A thermoplastic, polymer thick-film silver / silver-coated copper hybrid ink. Designed for use as a conductive circuit material for encapsulation-based technologies.

Carbon / Graphite Inks

Product	Conductivity	Markets	Features	Application	Description
XCMC-0401 F	<40 Ω/Sq./ml Flexo ink	A solvent-based, flexographic printable carbon ink, designed for multiple applications for low-cost printed circuitry and protective over print	• Very good adhesion to treated and untreated PET • Very good abrasion resistance	• Flexo printable • Cure at 120°C for 3 to 5 minutes • Thin and clean-up with carbitol acetate	A thermoplastic-based PTF carbon conductor ink for use as protective Ag overcoat and higher-resistance circuit printing. Can be blended to custom resistances with XCMSR-013 and XCMS-015.
XRMC-50	<50 Ω/Sq./ml	Printed resistors, potentiometers, and circuit jumpers on rigid and flexible circuits	• Very good adhesion to treated and untreated PET, CEM and FR4 • Good abrasion resistance	• Screen printable • Cure at 195°C for 90 seconds • Thin with butyl cellosolve acetate and clean with carbitol acetate	A flexible thermosetting epoxy-based PTF carbon resistor ink for use in blending with XRMG-15000 to achieve specified
XCMC-617	<40 Ω/Sq./ml	Membrane switches, EL lamp rear electrode, medical sensors, and overcoat barriers for Ag circuits	• Very good adhesion to treated and untreated PET • Very good abrasion resistance • Easy to clean	• Screen printable • Cure at 120°C for 3 to 5 minutes • Thin and clean-up with carbitol acetate	A thermoplastic-based PTF carbon conductor ink for use as protective Ag overcoat and higher-resistance circuit printing. Can be blended to custom resistances with XCMSR-013 and XCMS-015.
XRMG-15000	<15000 Ω/Sq./ml	Printed resistors, potentiometers, and circuit jumpers on rigid and flexible circuits	• Very good adhesion to treated and untreated PET, CEM and FR4 • Good abrasion resistance	• Screen printable • Cure at 120°C for 5 minutes • Thin with butyl cellosolve acetate and clean with carbitol acetate	A thermosetting epoxy-based PTF graphite resistor ink for use in blending with XRMC-50 to achieve specified bulk resistances
XCWCF-671	<40 Ω/Sq./ml Flexo ink	A water-based, flexographic printable carbon ink, designed for multiple applications for low-cost printed circuitry and protective over print	• Very good adhesion to treated and untreated PET • Very good abrasion resistance	• Flexo printable • Cure at 120°C for 3 to 5 minutes • Thin and clean-up with carbitol acetate	A thermoplastic-based PTF carbon conductor ink for use as protective Ag overcoat, and higher resistance circuit printing. Can be blended to custom resistances with XCMSR-013 and XCMS-015.

Dielectric Inks

Product	Appearance	Markets	Features	Application	Description
XUVD-100 (Green) XUVD-200 (Blue)	Gloss finish	Printed circuit crossovers, protective tail covers and dielectric overlays for all types of printed circuitry.	• Excellent dielectric-strength and durability • Good adhesion to print treated polyester • Exceptional flexibility • Withstands 1,500 volts @ 25 microns	• Screen printable • Cures at 600-800 MJ with mercury vapor lamp @ 300 watts • Clean-up with carbitol acetate	XUVD-150 / 250 is a UV-curable dielectric ink. It is formulated with an advanced Polyester Acrylate binder system that provides exceptional flexibility with excellent voltage breakdown resistance under adverse environmental conditions.
XUVD-150 (Green) XUVD-250 (Blue)	Matte finish	Printed circuit crossovers, protective tail covers and dielectric overlays for all types of printed circuitry.	• Excellent dielectric strength and durability • Good adhesion to print treated and non-print treated polyester • Exceptional flexibility • Withstands 1,500 volts @ 25 microns	• Screen printable • Cures at 600-800 MJ with mercury vapor lamp @ 300 watts • Clean-up with carbitol acetate	XUVD-150 / 250 is a UV-curable dielectric ink. It is formulated with an advanced polyester acrylate binder system that provides exceptional flexibility with excellent voltage breakdown resistance under adverse environmental conditions.
XUVD-540 (Blue) XUVD-640 (Green)	Matte finish	Printed circuit crossovers, protective tail covers and dielectric overlays for all types of printed circuitry.	• Excellent dielectric strength and durability • Good adhesion to print treated polyester • Exceptional flexibility • Withstands 1,500 volts @ 25 microns	• Screen printable • Cures at 600-800 MJ with mercury vapor lamp @ 300 watts • Clean-up with carbitol acetate	XUVD-540 is a UV-curable dielectric ink suitable for copper foil adhesion. It is formulated with an advanced polyester acrylate binder system that provides exceptional flexibility with excellent voltage breakdown resistance under adverse environmental conditions.
XHCD-506 (Blue)	Heat cure, blue dielectric	Printed circuit crossovers, protective tail covers and dielectric overlays for all types of printed circuitry.	• Excellent dielectric strength and durability • Good adhesion to print treated polyester • Exceptional flexibility • Withstands 1,500 volts @ 25 microns	• Screen printable • 130/3 mins • Clean-up with carbitol acetate	XHCD-506 is a heat-curable dielectric ink suitable for copper foil adhesion. It is formulated with an advanced binder system that provides exceptional flexibility with excellent voltage breakdown resistance under adverse environmental conditions.

PPG Industrial Coatings
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