

Product Data Sheet

Pad Printing Ink

SunChemical[®]
Coates Screen Inks

CRSN2419

CONDUCTIVE SILVER INK; Solvent Based, 1- and (alternatively) 2-Component

APPLICATION

Conductive silver ink CRSN2419 is a special product for pad printing of uncomplicated conductive elements, such as contacts, antennas and circuit tracks. CRSN2419 is suitable for printing on the following thermoplastics: polystyrene (PS), ABS, PMMA ("acrylic glass"), polycarbonate (PC) and rigid PVC. After addition of hardener also for pre-treated (flame treatment) polyamide (PA) and polyester.

PROPERTIES

- Conductive silver ink CRSN2419 is a solvent based pad printing ink. CRSN2419 can be processed as 1-component and (alternatively) as 2-component ink with hardener.
- **Conductive Medium:** Silver, bound in a thermoplastic resin mixture.
- **Solids content:** approx. 70%
- **Surface resistivity:** <0,500Ω/square (layer thickness of 10μ and double print after 24h/20°C)
- Processed as 1-component ink CRSN2419 dries physically, as 2-component ink physically chemically-reactive.
- CRSN2419 shows limited mechanical and chemical resistances. If necessary, resistances can be increased by processing the ink as 2-component system with hardener.
- CRSN2419 prints are only suitable for protected internal parts - indoor use only.
- **Note:**
Because of the variety of substrates, different designs of conductive elements and required conductivity comprehensive pre-tests are absolutely essential, as the quality of reproducibility of pad printed conductors is quite limited.

COLOUR SHADES - OVERVIEW

- Silver, conductive.

ADJUSTMENT FOR PAD PRINTING

- Pad printing ink CRSN2419 is not supplied in a ready-to-print adjustment.
- **Processed as 1-component ink (without addition of hardener):**
Ink is adjusted to printing consistency by addition of thinner or retarder (stir with mixer or agitator).
- **Processed as 2-component ink (with addition of hardener):**
As 2-component ink CRSN2419 has to be mixed with hardener at a specified ratio prior to processing. Thinner is added after addition of hardener.
The mixed ink should be allowed to pre-react for approx. 15 minutes prior to processing (recommendation). Processing is then possible for a specified period of time (=pot life).

Hardener:

Alternatively, pad ink CRSN2419 can be processed as 2-component ink with hardener TP 219.

Hardener is added to CRSN2419 at a specified ratio.

Ink : Hardener =20 : 1 (parts by weight)

Hardeners are sensitive to humidity. Therefore, containers always have to be tightly closed.

Pot life:

- Ink mixed with hardener may only be processed within a limited period of time (=pot life)
- **Pot life of CRSN2419 + hardener is approx. 8 h (at 20°C).**
Higher temperatures will reduce pot life.
- We do not recommend processing the inks for longer than the pot life as adhesion and resistance properties will then continually deteriorate, even if the ink still seems to be liquid and processable.

THINNERS / RETARDERS

Depending on local conditions ink is adjusted to printing consistency by addition of up to 10 % by weight of thinner or retarder. Amount of thinner will influence the electrical conductivity of the print and the quality of the printed image.

Generally, the thinner suitable for CRSN2419 is Additive A!

The additional products listed below should only be used if the required printing quality/ink transfer cannot be achieved using additive A (e.g. drying too slow or too fast).

For adjustment of pad ink CRSN2419, the following products are available:

Thinner:	<input type="radio"/> Additive C	Extremely quick thinner, good solving power
	<input checked="" type="radio"/> Additive A	Standard thinner
	<input type="radio"/> VD 60	Slow thinner
Retarder:	<input type="radio"/> TPD	Very slow retarder

■= Preferred ○= If required

Depending on printing conditions, the products listed above can be mixed into the inks individually or as mixtures. Please note that depending on evaporation rate of the thinner/retarder used drying times may be longer.

Thinner/retarder should be mixed into the ink thoroughly using a mixer or agitator. In addition, inks should be stirred well prior to each processing to obtain a homogeneous dispersion of all ingredients.

ADDITIONAL AUXILIARY AGENTS

Apart from thinner and hardener, other auxiliary agents/additives are not required.

DRYING / HARDENER REACTION

1. **Processing WITHOUT addition of hardener:**
Ink dries physically, i.e. by evaporation of solvents.
2. **Processing WITH addition of hardener TP 219:**
First, ink dries physically, followed by chemical cross-linkage reaction.
Drying and reaction temperature of hardener must be at least 15°C when using TP 219!

Drying

Drying times below are only approximate as drying properties depend on various factors:

- Type and amount of thinners/retarders used.
- Thickness of printed ink layer (single print, multi-layer print).
- Drying temperature.

Depending on local conditions, average drying time is approx. 30 – 60 seconds. Drying time with heat application (e.g. hot air fan) and air circulation is about 10 - 20 seconds.

Complete drying may take several hours, also depending on the substrate.

Hardener Reaction

Basically, the increased resistance properties of the printed ink film are only achieved after complete drying followed by chemical cross linkage reaction between ink and hardener. This cross linkage reaction depends on time and temperature.

The following are guide values only:

Temperature	Time approx.	Condition of ink	Additional information
<15°C air drying		Hardener TP 219 does not react!	Ink film will not achieve any resistance
20°C air drying	20 min.	"Touch-dry"	No resistance yet
	>72 h	High degree of cross-linkage	High resistances achieved
	>5 days	Maximum degree of cross-linkage	Maximum resistances achieved
80°C oven curing*	approx. 5 min.	Dry enough for overprinting	No resistance yet
	60 min.	High degree of cross-linkage	High resistance values achieved

* Oven curing 80°C only for heat-resistant substrates!

Resistance Tests

Resistances and conductivity should not be checked before the ink has fully cured/cross-linked:

When processed as 1-component ink without hardener drying methods such as applying fresh, warm air are suitable to ensure that all solvents have completely evaporated.

When processed as 2-component ink chemical cross-linkage of hardener must be completed. Drying with 20°C/>72h; with 80°C/>60 minutes.

CLICHÉ

All commercial types of clichés (polymer, thin and thick steel, ceramic) are suitable for processing CRSN2419. Depending on the motive and the required conductivity values unscreened thin or thick steel clichés may be better than screened clichés.

CLEANING

When processed as 1-component system clichés, ink pots and tools can easily be cleaned. When processing as 2-component system the longer inks dry on clichés, pots and tools the harder will be their removal due to the chemical cross-linkage reaction. Therefore, always remove ink residues as soon as possible using our universal cleaning agents URS, URS 3 or thinner VD 40.

PACK SIZE

Pad printing inks CRSN2419 are delivered in 1 kilo containers. Other pack sizes are available upon request.

SHELF LIFE

In closed original containers, CRSN2419 ink generally has a shelf life of 1 year from date of production. Hardener TP 219 has a shelf life of 14 months from date of production, also in closed original containers.

For exact date of expiry, please refer to the label.

SAFETY DATA SHEETS

Read safety data sheet prior to processing

Safety data sheets comply with Regulation (EC) No. 1907/2006 (REACH), Appendix II.

CLASSIFICATION AND LABELLING

Hazard classification and labelling comply with Regulation (EC) No. 1272/2008 (CLP/GHS).

CONFORMITY

Coates Screen Inks GmbH does not use any of the substances or mixtures for the production of printing inks, which are banned according to the EUPIA (European Association of the Printing Inks Industry) exclusion policy. Further compliance confirmations are available upon request.

ADDITIONAL INFORMATION ABOUT OUR PRODUCTS

Brochures: Pad Printing Inks

Internet: Various technical articles are available for download on www.coates.de, section "SN-Online"

COLOUR SHADE

STANDARD	
Silver	CRSN2419

The statements in our product and safety data sheets are based on our present experiences, however they are no assurance of product properties and do not justify a contractual legal relationship. We provide these details to inform customers about our products and their possible applications. However, on account of various factors influencing processing of our products it is absolutely essential to carry out printing trials under local production conditions. Choice of individual ink types and their suitability for the intended application is the sole and entire responsibility of the user. We do not assume any liability for any problems of technical or process-related nature. Any liability shall be limited to the value of the goods delivered by us and processed by the user.

All former product data sheets are no longer valid.

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Coates Screen Inks GmbH
Wiederholdplatz 1 90451 Nürnberg
Tel.: 0911 6422 0 Fax: 0911 6422 200
<http://www.coates.de>