Yuxiling New Material
YXL NEW MATERIAL

Nano conductive materials / Selection and applications

Nano Metal Conductive Materials Brochure

Silver nanowires / Ag powder / Ag paste / Cu / Ni / Sn powder

47	29	28	50
Ag	Cu	Ni	Sn
Silver	Copper	Nickel	Tin

For transparent conductive films, printed electronics, power interconnects, MLCC internal electrodes and low-temperature joining.

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01

Contents and selection guide

Product Selection Matrix

Product code/series	Elem.	Form/size	Mature-use direction	Selection note
HF-NWAG-08	Ag	Wire dispersion 8-10 nm	Transparent films	Aspect ratio/medium
HF-NPAG-20	Ag	Powder 20-40 nm	Printed / Ag sinter	PSD/sinter window
HF-NSAG-40	Ag	Paste 40-60 nm	Printed electrodes	Rheology/cure
HF-NPAG-100	Ag	Powder 100-140 nm	Thick-film / filler	Loading/dispersion
HF-NSAG-130	Ag	Paste 130-150 nm	Thick-film/interconnect	Rheology/cure
HF-NPCU-40	Cu	Powder 40-60 nm	Printed traces/antenna	Oxidation/atmosphere
HF-NPCU-100	Cu	Powder 100-140 nm	Shielding/filler	Oxidation/dispersion
HF-NPNI-40	Ni	Powder 40-60 nm	MLCC electrodes	PSD/oxide shell
HF-NPNI-100	Ni	Powder 100-140 nm	Ceramic electrodes/filler	Sintering/dispersion
HF-NPSN-40	Sn	Powder 40-60 nm	R&D/formulation	Alloy/oxygen
HF-NPSN-100	Sn	Powder 100-140 nm	R&D/formulation	Alloy/reflow
Ag paste series	Ag	Paste/by grade	Touch/switch/adhesive	Substrate/Rs/cure

01

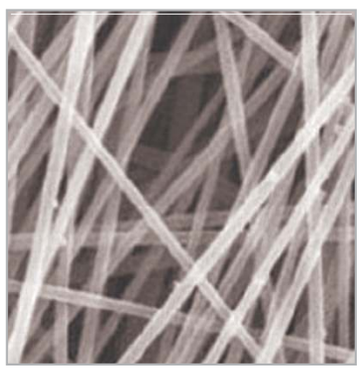
Silver nanowires Dia. 8-10 nm

Ag

Product code HF-NWAG-08 / Wire dispersion / Batch data per COA

Overview Silver nanowire dispersion for transparent conductive films where optical transparency and conductivity are both required.

Appearance reference



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Typical Specifications

Item	Typical value / acceptance basis
Purity	Batch purity: confirm by COA/ICP report
Typical particle size	Typical: Dia. 8-10 nm; length 10-15 um; final: COA/PSD
Product colour	Clear to pale grey dispersion; confirm by sample/COA/TDS
Morphology	Wire-like; confirm by SEM/TEM
Bulk density	Depends on medium, solids and grade; final: TDS/COA
Element density reference	10.49 g/cm3 theoretical constant
Note	Typical values for product selection only. Final acceptance shall be based on the corresponding COA and TDS.

Mature Uses

- Transparent electrodes for touch, flexible display and OLED devices.
- Transparent heating, shielding and bendable conductive coatings.

R&D / Emerging

- Stretchable sensors, e-skin and wearable electrodes.
- Transparent antennas, RF structures and smart-window films.

Engineering

Network conductivity depends on wire size, coating weight, post-treatment and substrate.

Ordering

Confirm application, size, medium/solids, packaging, MOQ, lead time and documents.

02

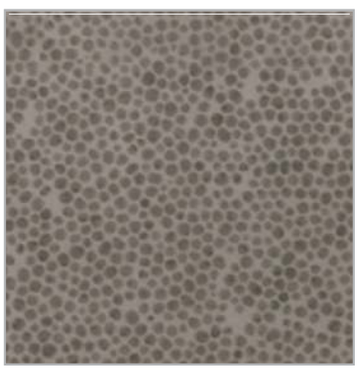
Silver nanopowder 20-40 nm

Ag

Product code HF-NPAG-20 / Powder / Batch data per COA

Overview Silver nanopowder for conductive inks, silver sintering and composite conductor systems; batch values by COA.

Appearance reference



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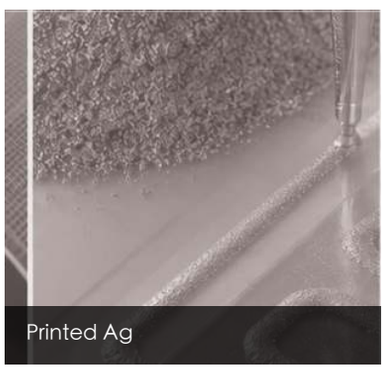


Typical Specifications

Item	Typical value / acceptance basis
Purity	Batch purity: confirm by COA/ICP report
Typical particle size	Typical: 20-40 nm; final: COA/PSD
Product colour	Surface-dependent; confirm by sample/COA
Morphology	Predominantly spherical; confirm by SEM/TEM
Bulk density	Confirm by batch COA measurement
Element density reference	10.49 g/cm3 theoretical constant
Note	Typical values for product selection only. Final acceptance shall be based on the corresponding COA and TDS.

Mature Uses

- Conductive inks/pastes for printed traces, RFID and membrane switches.
- Low-temperature conductive layers on plastics or flexible substrates.

R&D / Emerging

- Aerosol/inkjet fine lines and high-resolution sensor electrodes.
- Flexible medical patches, wearable electrodes and soft interconnects.

Engineering

Sintering depends on particle size, surface treatment, film thickness, substrate and cure.

Ordering

Confirm application, size, medium/solids, packaging, MOQ, lead time and documents.

03

Silver nanopaste 40-60 nm

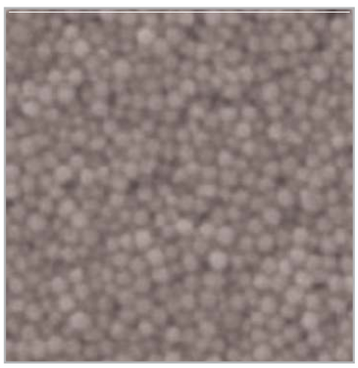
Ag

Product code HF-NSAG-40 / Paste / Batch data per COA

Overview

Ag paste candidate for low-temperature printed conductors, packaging interconnects and conductive repair.

Appearance reference



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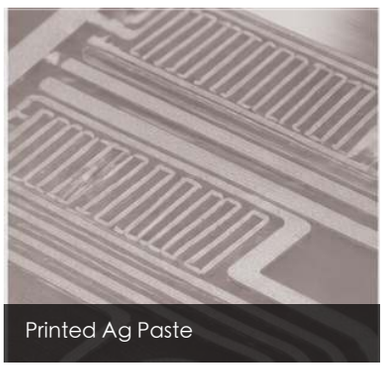


Printed Ag Paste

Typical Specifications

Item	Typical value / acceptance basis
Purity	Batch purity: confirm by COA/ICP report
Typical particle size	Typical: 40-60 nm; final: COA/PSD
Product colour	Formulation-dependent; confirm by sample/TDS
Morphology	Predominantly spherical; confirm by SEM/TEM
Bulk density	Depends on solids, solvent system and grade; final: TDS/COA
Element density reference	10.49 g/cm3 theoretical constant
Note	Typical values for product selection only. Final acceptance shall be based on the corresponding COA and TDS.

Mature Uses

- Printed conductive patterns, sensor electrodes, keypad/membrane circuits.
- RFID, flexible-PCB reinforcement traces and conductive repair.

R&D / Emerging

- Low-temperature solderable or sinterable interconnects.
- Local interconnects for micro-LED, transparent and flexible devices.

Engineering

Sintering depends on particle size, surface treatment, film thickness, substrate and cure.

Ordering

Confirm application, size, medium/solids, packaging, MOQ, lead time and documents.

04

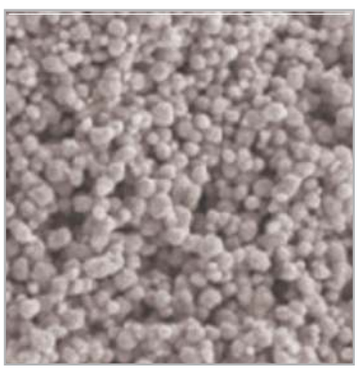
Ultrafine silver powder 100-140 nm

Ag

Product code HF-NPAG-100 / Powder / Batch data per COA

Overview Ultrafine silver powder for conductive inks, silver sintering and composite conductor systems; batch values by COA.

Appearance reference



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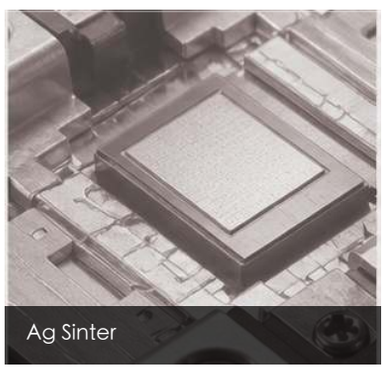


Typical Specifications

Item	Typical value / acceptance basis
Purity	Batch purity: confirm by COA/ICP report
Typical particle size	Typical: 100-140 nm; final: COA/PSD
Product colour	Surface-dependent; confirm by sample/COA
Morphology	Predominantly spherical; confirm by SEM/TEM
Bulk density	Confirm by batch COA measurement
Element density reference	10.49 g/cm3 theoretical constant
Note	Typical values for product selection only. Final acceptance shall be based on the corresponding COA and TDS.

Mature Uses

- High-solids conductive pastes, thick-film electrodes and printed layers.
- Conductive adhesive/coating filler balancing loading and dispersion.

R&D / Emerging

- Silver powder/flake blends for cost and rheology control.
- Low-void silver sintered layers and large-area module joining.

Engineering

Sintering depends on particle size, surface treatment, film thickness, substrate and cure.

Ordering

Confirm application, size, medium/solids, packaging, MOQ, lead time and documents.

05

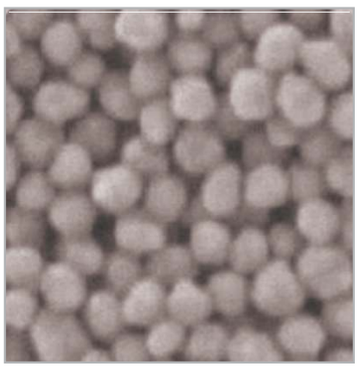
Ultrafine silver paste 130-150 nm

Ag

Product code HF-NSAG-130 / Paste / Batch data per COA

Overview Ag paste candidate for low-temperature printed conductors, packaging interconnects and conductive repair.

Appearance reference



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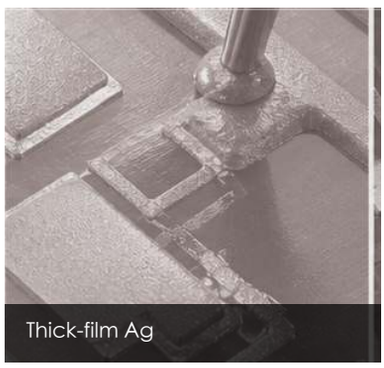


Thick-film Ag

Typical Specifications

Item	Typical value / acceptance basis
Purity	Batch purity: confirm by COA/ICP report
Typical particle size	Typical: 130-150 nm; final: COA/PSD
Product colour	Formulation-dependent; confirm by sample/TDS
Morphology	Predominantly spherical; confirm by SEM/TEM
Bulk density	Depends on solids, solvent system and grade; final: TDS/COA
Element density reference	10.49 g/cm3 theoretical constant
Note	Typical values for product selection only. Final acceptance shall be based on the corresponding COA and TDS.

Mature Uses

- Thick-film conductive pastes, packaging interconnects and coatings.
- Printed traces, contact electrodes and shielding layers.

R&D / Emerging

- Module-level or low-pressure silver sintering.
- Printable RF devices and flexible hybrid integration.

Engineering

Sintering depends on particle size, surface treatment, film thickness, substrate and cure.

Ordering

Confirm application, size, medium/solids, packaging, MOQ, lead time and documents.

06

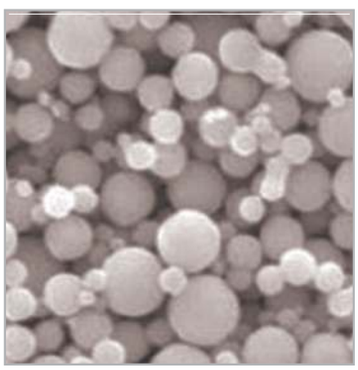
Copper nanopowder 40-60 nm

Cu

Product code HF-NPCU-40 / Powder / Batch data per COA

Overview Copper nanopowder for cost-sensitive printed conductors, antennas and EMI/thermal filler systems.

Appearance reference



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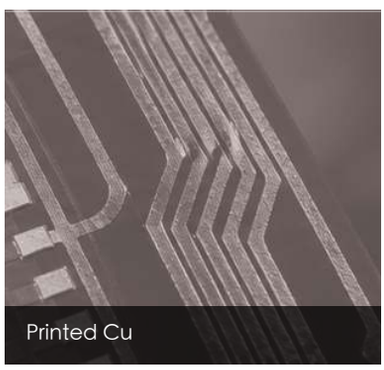


Typical Specifications

Item	Typical value / acceptance basis
Purity	Batch purity: confirm by COA/ICP report
Typical particle size	Typical: 40-60 nm; final: COA/PSD
Product colour	Reddish brown to dark brown powder; confirm by sample/COA
Morphology	Predominantly spherical; confirm by SEM/TEM
Bulk density	Confirm by batch COA measurement
Element density reference	8.96 g/cm3 theoretical constant
Note	Typical values for product selection only. Final acceptance shall be based on the corresponding COA and TDS.

Mature Uses

- Lower-cost conductive ink/paste candidate for printed traces and antennas.
- Conductive adhesive, EMI coatings and thermal/electrical fillers.

R&D / Emerging

- Lower-cost flexible printed electronics as a silver alternative.
- Photonic, pulse or chemical sintering of copper traces.

Engineering

Control oxidation and atmosphere during copper storage, dispersion and sintering.

Ordering

Confirm application, size, medium/solids, packaging, MOQ, lead time and documents.

07

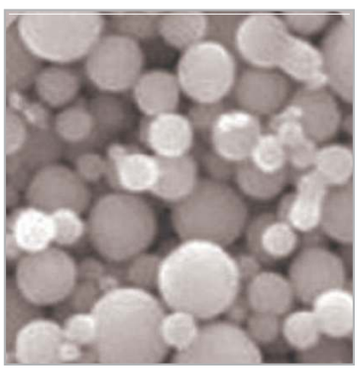
Ultrafine copper powder 100-140 nm

Cu

Product code HF-NPCU-100 / Powder / Batch data per COA

Overview Ultrafine copper powder for cost-sensitive printed conductors, antennas and EMI/thermal filler systems.

Appearance reference



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Cu Shielding

Typical Specifications

Item	Typical value / acceptance basis
Purity	Batch purity: confirm by COA/ICP report
Typical particle size	Typical: 100-140 nm; final: COA/PSD
Product colour	Reddish brown to dark brown powder; confirm by sample/COA
Morphology	Predominantly spherical; confirm by SEM/TEM
Bulk density	Confirm by batch COA measurement
Element density reference	8.96 g/cm3 theoretical constant
Note	Typical values for product selection only. Final acceptance shall be based on the corresponding COA and TDS.

Mature Uses

- Conductive/thermal composite fillers and EMI shielding coatings.
- Copper thick-film pastes and printed conductor development.

R&D / Emerging

- Cu-Ag or Cu-carbon conductive blends for cost reduction.
- Large-area flexible circuits and more sustainable copper inks.

Engineering

Control oxidation and atmosphere during copper storage, dispersion and sintering.

Ordering

Confirm application, size, medium/solids, packaging, MOQ, lead time and documents.

08

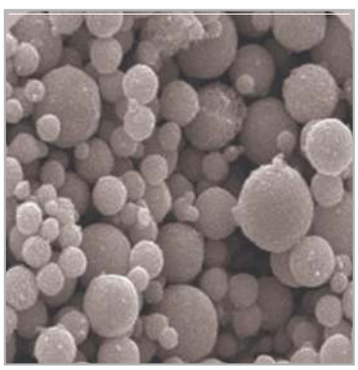
Nickel nanopowder 40-60 nm

Ni

Product code HF-NPNI-40 / Powder / Batch data per COA

Overview Nickel nanopowder for MLCC internal electrodes, nickel conductive fillers and magnetic/conductive composites.

Appearance reference



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Typical Specifications

Item	Typical value / acceptance basis
Purity	Batch purity: confirm by COA/ICP report
Typical particle size	Typical: 40-60 nm; final: COA/PSD
Product colour	Dark grey to black powder; confirm by sample/COA
Morphology	Predominantly spherical; confirm by SEM/TEM
Bulk density	Confirm by batch COA measurement
Element density reference	8.90 g/cm3 theoretical constant
Note	Typical values for product selection only. Final acceptance shall be based on the corresponding COA and TDS.

Mature Uses

- Powder route for nickel paste in MLCC internal electrodes.
- Thick-film electrodes, shielding/conductive coatings and Ni fillers.

R&D / Emerging

- Thinner MLCC internal electrodes and finer Ni dispersions.
- Printable nickel electrodes and microelectronic interconnects.

Engineering

Oxide shell, PSD and dispersion affect sintering and conductive continuity.

Ordering

Confirm application, size, medium/solids, packaging, MOQ, lead time and documents.

09

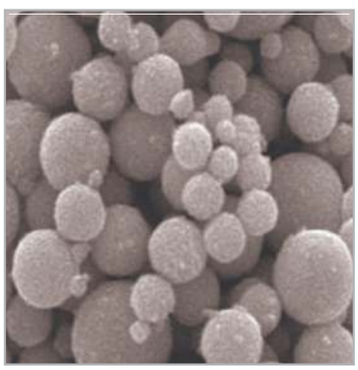
Ultrafine nickel powder 100-140 nm

Ni

Product code HF-NPNI-100 / Powder / Batch data per COA

Overview Ultrafine nickel powder for MLCC internal electrodes, nickel conductive fillers and magnetic/conductive composites.

Appearance reference



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Typical Specifications

Item	Typical value / acceptance basis
Purity	Batch purity: confirm by COA/ICP report
Typical particle size	Typical: 100-140 nm; final: COA/PSD
Product colour	Dark grey to black powder; confirm by sample/COA
Morphology	Predominantly spherical; confirm by SEM/TEM
Bulk density	Confirm by batch COA measurement
Element density reference	8.90 g/cm3 theoretical constant
Note	Typical values for product selection only. Final acceptance shall be based on the corresponding COA and TDS.

Mature Uses

- Internal electrode material development for MLCC/electronic ceramics.
- Nickel conductive coatings, shielding layers and composite fillers.

R&D / Emerging

- Low-shrinkage nickel pastes and Ni-Cu/Ni-carbon blends.
- Particle-size and oxide-shell control for miniaturized MLCCs.

Engineering

Oxide shell, PSD and dispersion affect sintering and conductive continuity.

Ordering

Confirm application, size, medium/solids, packaging, MOQ, lead time and documents.

10

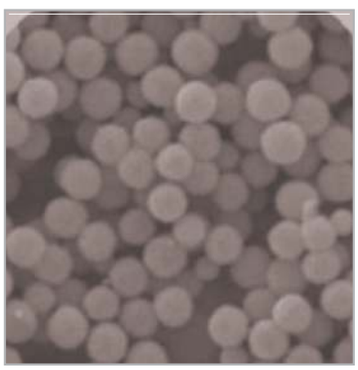
Tin nanopowder 40-60 nm

Sn

Product code HF-NPSN-40 / Powder / Batch data per COA

Overview Tin nanopowder for formulation research in Sn-based joining and low-melting composites; commercial suitability requires project validation.

Appearance reference



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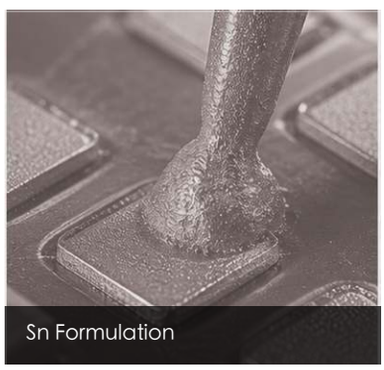


Sn Formulation

Typical Specifications

Item	Typical value / acceptance basis
Purity	Batch purity: confirm by COA/ICP report
Typical particle size	Typical: 40-60 nm; final: COA/PSD
Product colour	Grey metallic powder; confirm by sample/COA
Morphology	Predominantly spherical; confirm by SEM/TEM
Bulk density	Confirm by batch COA measurement
Element density reference	7.31 g/cm3 theoretical constant
Note	Typical values for product selection only. Final acceptance shall be based on the corresponding COA and TDS.

Mature Uses

- Mature solder paste/SMT uses micron-scale Sn-alloy powders, not this elemental nano-Sn grade.

R&D / Emerging

- Nano-tin low-temperature solder paste and low-thermal-budget packaging.
- Low-temperature interconnects for flexible and heat-sensitive devices.

Engineering

Control storage temperature, oxidation and moisture; validate joining window by project.

Ordering

Confirm application, size, medium/solids, packaging, MOQ, lead time and documents.

11

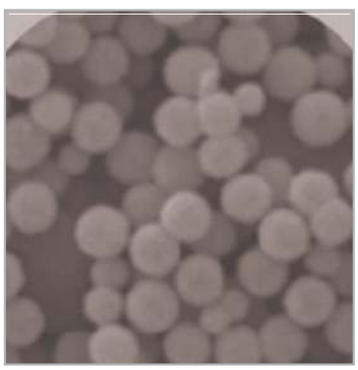
Ultrafine tin powder 100-140 nm

Sn

Product code HF-NPSN-100 / Powder / Batch data per COA

Overview Ultrafine tin powder for formulation research in Sn-based joining and low-melting composites; commercial suitability requires project validation.

Appearance reference



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Sn Low-temp R&D

Typical Specifications

Item	Typical value / acceptance basis
Purity	Batch purity: confirm by COA/ICP report
Typical particle size	Typical: 100-140 nm; final: COA/PSD
Product colour	Grey metallic powder; confirm by sample/COA
Morphology	Predominantly spherical; confirm by SEM/TEM
Bulk density	Confirm by batch COA measurement
Element density reference	7.31 g/cm3 theoretical constant
Note	Typical values for product selection only. Final acceptance shall be based on the corresponding COA and TDS.

Mature Uses

- Mature solder paste/SMT uses micron-scale Sn-alloy powders, not this ultrafine elemental Sn grade.

R&D / Emerging

- Nano/submicron tin powder for low-temperature sintering.
- Sn-Bi and Sn-Ag-Cu modification and reliability improvement.

Engineering

Control storage temperature, oxidation and moisture; validate joining window by project.

Ordering

Confirm application, size, medium/solids, packaging, MOQ, lead time and documents.

APPLICATION 01

Touch-screen silver paste

Ag

Low-temperature Ag paste / Final data by TDS, COA and project test

Overview

For ITO film/PET touch electrodes and fine printed lines, with focus on adhesion, conductivity and print stability.

Touch Display Paste

Selection Profile

Substrate	Process	Confirm
ITO/PET touch film	Fine-line screen printing	Adhesion, Rs, cure window

Typical Specifications

Item	Typical parameter / basis
Solids	Typical: 76±2 wt.%; final by TDS/COA
Viscosity	Typical: 250-350 poise; final by TDS/COA
Density	Typical: 2.5-3.0 g/cm³; final by TDS/COA
Sheet resistance	Typical target: <50 mΩ/□; confirm by thickness/substrate/cure/method
Note	Typical values for product selection only. Final acceptance shall be based on the corresponding COA and TDS.

Mature Uses

- Touch-screen bezel traces and ITO-PET electrode lead-out lines.
- Phones, tablets, smart panels and HMI display modules.

R&D / Emerging

- Conductive traces for flexible touch panels and foldable devices.
- Edge interconnects for transparent or translucent sensor modules.

Engineering

Validate electrical and reliability targets on the customer's substrate, film thickness and cure window.

Ordering

Provide substrate, target performance, print method, cure window, line/space and documents.

APPLICATION 02

Potentiometer membrane silver paste

Ag

Low-temperature Ag paste / Final data by TDS, COA and project test

Overview

For PET potentiometer membrane conductive tracks, focused on low resistance, adhesion and resistance stability after heat/humidity exposure.

Potentiometer Membrane Paste

Selection Profile

Substrate	Process	Confirm
PET potentiometer film	Conductive-track printing	Resistance after heat/humidity

Typical Specifications

Item	Typical parameter / basis
Solids	Typical: 67±2 wt.%; final by TDS/COA
Viscosity	Typical: 250-350 poise; final by TDS/COA
Density	Typical: 1.8-2.2 g/cm³; final by TDS/COA
Sheet resistance	Typical target: <40 mΩ/□; confirm by thickness/substrate/cure/method
Note	Typical values for product selection only. Final acceptance shall be based on the corresponding COA and TDS.

Mature Uses

- Conductive tracks for potentiometer membranes.
- PET film sensor and controller circuits.

R&D / Emerging

- Film sensors for automotive and industrial HMI.
- Wearable flexible pressure/position sensing membranes.

Engineering

Validate electrical and reliability targets on the customer's substrate, film thickness and cure window.

Ordering

Provide substrate, target performance, print method, cure window, line/space and documents.

APPLICATION 03

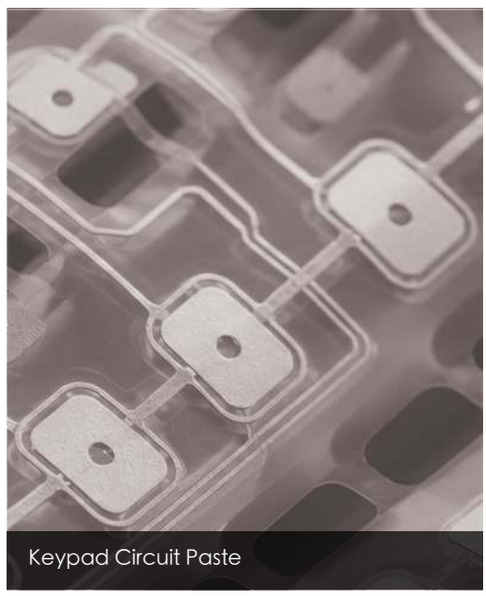
Keypad silver paste

Ag

Low-temperature Ag paste / Final data by TDS, COA and project test

Overview

For PET keypad and button-membrane circuits, balancing low resistance, flexibility, adhesion and printability.



Keypad Circuit Paste

Selection Profile

Substrate	Process	Confirm
PET keypad membrane	Low-temp screen print	Bending, adhesion, continuity

Typical Specifications

Item	Typical parameter / basis
Solids	Typical: 42±2 wt.%; final by TDS/COA
Viscosity	Typical: 250-350 poise; final by TDS/COA
Density	Typical: 1.8-2.2 g/cm³; final by TDS/COA
Sheet resistance	Typical target: <40 mΩ/□; confirm by thickness/substrate/cure/method
Note	Typical values for product selection only. Final acceptance shall be based on the corresponding COA and TDS.

Mature Uses

- Conductive circuits for membrane keypads.
- Button membranes for appliances, instruments and consumer electronics.

R&D / Emerging

- Flexible input interfaces and rollable control panels.
- Low-temperature soft-electronic button/sensor integration.

Engineering

Validate electrical and reliability targets on the customer's substrate, film thickness and cure window.

Ordering

Provide substrate, target performance, print method, cure window, line/space and documents.

APPLICATION 04

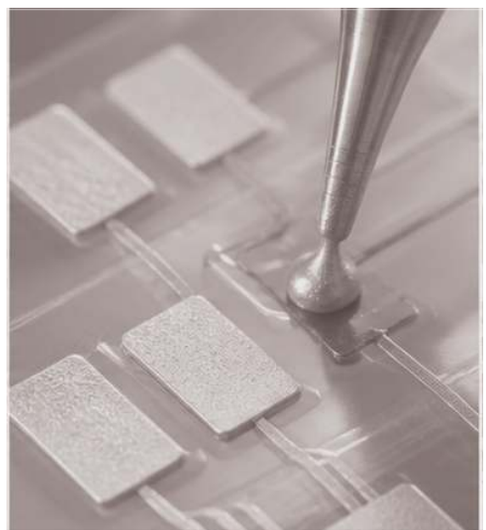
Conductive adhesive silver paste

Ag

Low-temperature Ag paste / Final data by TDS, COA and project test

Overview

For printable conductive adhesive or large-area conductive layers, focused on volume resistivity, PET/PC adhesion and processability.



Conductive Adhesive Paste

Selection Profile

Substrate	Process	Confirm
PET/PC films	Large-area conductive bonding	Volume resistance and workability

Typical Specifications

Item	Typical parameter / basis
Appearance	Silver grey
Viscosity	Typical: 19 Pa· s (Brookfield DV2T CPS1#, 18 RPM); final by TDS/COA
Volume resistivity	Typical target: 1.0×10^-7 Ω· m ; confirm by thickness/substrate/cure/method
Cure	Typical reference: 150° C, 40 min; confirm by test method/TDS
Note	Typical values for product selection only. Final acceptance shall be based on the corresponding COA and TDS.

Mature Uses

- Conductive adhesive, bonding and large-area screen-printed layers.
- PET/PC film circuits and sensor electrodes.

R&D / Emerging

- Low-temperature printable interconnect materials.
- Conductive bonding layers in flexible hybrid integration.

Engineering

Validate electrical and reliability targets on the customer's substrate, film thickness and cure window.

Ordering

Provide substrate, target performance, print method, cure window, line/space and documents.

APPLICATION 05

Membrane switch silver paste

Ag

Low-temperature Ag paste / Final data by TDS, COA and project test

Overview

For PET membrane-switch circuits, focused on low resistance, adhesion, bending reliability and storage stability.

Membrane Switch Paste

Selection Profile

Substrate	Process	Confirm
PET membrane switch	High-volume screen print	Bending and storage stability

Typical Specifications

Item	Typical parameter / basis
Solids	Typical: 63±2 wt.%; final by TDS/COA
Viscosity	Typical: 250-350 poise; final by TDS/COA
Density	Typical: 1.8-2.2 g/cm³; final by TDS/COA
Sheet resistance	Typical target: <50 mΩ/□; confirm by thickness/substrate/cure/method
Note	Typical values for product selection only. Final acceptance shall be based on the corresponding COA and TDS.

Mature Uses

- Membrane switches, flexible circuits and control-panel traces.
- EL panels, sensor electrodes and film circuits.

R&D / Emerging

- Flexible HMI, wearable control panels and low-temperature soft interconnects.
- Recyclable or lower-solvent conductive paste systems.

Engineering

Validate electrical and reliability targets on the customer's substrate, film thickness and cure window.

Ordering

Provide substrate, target performance, print method, cure window, line/space and documents.

05

Company Profile

Hunan Yuxiling New Material Co., Ltd.

YXL NEW MATERIAL

Hunan Yuxiling New Material Co., Ltd. is a new-materials company focused on self-developed advanced materials and electronic chemicals for semiconductor-related applications, with R&D, manufacturing, sales and on-site service.

Five Product Families

01	Flexible transparent conductive materials
02	Negative-thermal-expansion materials
03	High-k nanomaterials
04	Lithium-battery cathode/anode materials
05	Infrared cut-off materials

- Service: application-led selection, sample coordination, COA/SDS and test-condition confirmation.
- Business: packaging, MOQ, lead time and document package are confirmed by product code and project.

Contact

Email: kela_overseas@greatkela.com

Website: www.ruisunm.cn

06

Quality, Delivery and Sampling

Documents	• COA: batch purity, size/morphology and density. • SDS: confirm by hazard, medium and packaging. • Compliance: formal certificates or reports only.
Quality Control	• Confirm ICP, SEM/TEM and PSD. • Pastes: solids, viscosity, medium and stability. • Powders: oxidation, agglomeration, moisture and storage.
Delivery	• Packaging: bottles, bags, sealed or paste containers. • MOQ, lead time and capacity: confirm by grade. • Export compliance: by destination, SDS and end use.

Sampling Information

- Target: transparent film, printed traces, Ag sinter, MLCC electrode, Sn formulation or adhesive.
- Process: medium, resin/solvent, solids, viscosity, coating and cure/sinter window.
- Reliability: sheet/volume resistance, bending, adhesion, heat/humidity and storage.
- Documents: COA, SDS, TDS, packaging, MOQ, lead time, standards, lab and report number.

Purchase Action

Send target application, expected volume, temperature window, substrate and performance targets; the sales/technical team will match samples, documents and quotation by product code/series.

Request Samples / COA / SDS / Packaging and Lead Time

Request samples and documents: kela_overseas@greatkela.com | www.ruisunm.cn