



- 1 Features**
- 2 General Specifications**
- 3 Process**
- 4 Process Recommendations**
- 5 Handling Instructions of This Chemical**
- 6 End Properties**
- 7 Caution for safety**

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Silver paste for Electrode Material

TSP-3000 MS001

1. FEATURES

TSP-3000 MS001 is 1-component, thermally curable paste with following feature :

- Excellent Conductivity
- Excellent Adhesion
- Good Flexibility
- High Reliability

2. GENERAL SPECIFICATIONS

Product name	TSP-3000 MS001
Composition	1-component
Color	Silverly-white
Viscosity	250 Ps (Cone-plate type viscometer at 5rpm/25°C)
Ti(Thixotropic index)	1.60
Specific Gravity	1.40
Solid content	50.0wt%
Pot-Life	24hrs.
Shelf-Life	6 month after manufacturing (10~20°C, in dark room)

※ Viscosity is changed according to using conditions.

1) Lot No. of Product

Lot No.	2018	05	01	1	01
Explanation	Year	Month	Day	Divide	Number

3. PROCESS

Control the recommendation listed in below properly.

When it is not like that, this is responsible for quality and reliability deterioration.

1) Pre-treatment

- Acid treatment → Grinding (physical, chemical) → Rinse → Drying
- The contaminations of board cause the conductivity, adhesion and reliability deterioration. So that, Clean, Drying the board to avoid any trace of oil, grease and dust.

2) Screen printing

Before "TSP-3000 MS001" is used, it must be made absolutely homogeneous by stirring it in original container at 50-100 rpm.

To adjust the viscosity, apply the TAIYOINK diluent as regulator agent

- Recommendation Screen : 120 ~ 180mesh Polyester screen, with solvent resistant
: Emulsion thickness is 60-100 microns
- Recommendation Squeeze : Polyurethane squeegee(hardness:70~80), A bevel between squeegee and screen is necessary to force with 65-80° angle.
- Rinse of Screen : Solvent of Carbitol or Cellosolve type.

3) Drying and Curing

- Drying : Process for less Void at 3~5min. at 20~30°C(Room temperature)
- Curing : Within 10~30minute at 120 ~ 150°C.(Recommend : 30min. at 120°C)
- Curing type : Perpendicular or horizontal type

4. PROCESS RECOMMENDATIONS

- Keep the workplace clean to prevent dust and foreign substance
- Various contamination on the substrate can cause deterioration of quality and reliability
- Recommended operation environment is a clean room of 20 to 25°C temperature and 40 to 60%RH
- First let the temperature of the ink to reach the room temperature, then open the can and air sufficiently before use
- Curing condition depends on the type of the curing oven, the number of boards entered into it, and other parameters. Verification test should be conducted to define the operating conditions. Insufficient curing will lower the end properties
- Screen can be cleaned with Carbitol-base or Cellosolve-base solvent cleaners

5. HANDLING INSTRUCTIONS OF THIS CHEMICAL

All kind of chemicals should be handled with extreme care, since any chemicals can have unknown harmfulness. Prior to use this material, you should refer to the related material safety data sheet(MSDS) and usage instruction manual for the necessary instructions for handling this material.

6. END PROPERTIES

1) Electrical property

Items	Test condition	Test result
Volume Resistivity	120°C, 30min.	Below $6.0 \times 10^{-4} \Omega \text{cm}$
Sheet Resistivity	120°C, 30min.	Below $0.40 \Omega/\square(15 \mu\text{m})$

2) Coating Characteristics

Items	Test condition	Test result
Adhesion	100/100 (CROSS CUT TAPE TEST)	100 / 100
Pencil Hardness	Pencil Hardness test	$\geq 1\text{H}$

3) Reliability Characteristics

Items	Test condition	Test result
P C T	121°C, 95%RH (2ATM), 8 hr.	Resistivity Change rate : Below $\pm 100\%$
Constant Temp. & Humi. test	60°C, 90%RH, 240 hr.	Resistivity Change rate : Below $\pm 100\%$

Remarks:

- The contents of this technical datasheet are based on the results of our extensive experiments and only for reference, not to guarantee the same in your process.

7. CAUTION FOR SAFETY

- Before use, read caution for safety and use exactly.
- The Caution for safety is to prevent danger or damage beforehand in using the product.
- Make the workers to know the caution for safety in catalog.



WARNING

- * Use a suitable conveyance tool at transfer of heavy thing. When convey by oneself, take right posture. Excessive force may cause injury and lumbago.
- * When use, put protection mask, goggle and protection gloves etc. Injury can happen by inhalation and contact in a long or short time.
- * Install local exhauster in operation room. While using, the case which long time or excess amount will inhale the fume it is nauseous, vomit, dizzy and the internal organs damage etc. will be able to occur.
- * After using, annul the empty receptacle without another application.
- * Dispose of the waste according to related law. It can cause serious environmental pollution that incinerate or abandon the waste in land and water.

CAUTION AT USE

- * Avoid direct sunlight, heat source and fire.
- * Necessarily, keep the optimum temperature(10 ~ 20°C). Use the inks at least 1day after leaving alone at recommendation temperature to intercept the inflow of water and make the state stable.
- * Do not use the product when the shelf-life is expired.
- * When the pot-life is expired or the ink is leaved alone long hours, don't use.

Misapplication different from above contents results in quality and reliability deterioration.