

January 15, 2024

## **Sumitomo Metal Mining Jointly Develops Thick Film Conductive Ink for Printed Electronics Applicable to Large Current/Area Circuits**

The Companies to Showcase New Ink at NEPCON JAPAN 2024 Starting January 24

Sumitomo Metal Mining Co., Ltd. (TSE: 5713), the National Institute for Materials Science (NIMS), the NIMS startup company Priways Co., Ltd., and N.E. Chemcat Corporation (“the Companies”) have jointly developed a thick film conductive ink to accelerate the expansion of a market for printed electronics (PE) - a technology for printing electronic circuits and sensors on film and other such substrates.

Sumitomo Metal Mining and Priways will exhibit (\*1) this developed product at the NEPCON JAPAN 2024 exhibition to be held from January 24th, and embark on marketing activities.

In contrast to the conventional technology for formation of electronic circuits whereby areas that are unnecessary are removed from a metal film (a subtractive method), PE is a technology for electronic circuit board manufacturing that enables the formation of circuits by printing only the required parts (an additive method) and thus can be expected to achieve reductions in areas including metal usage volumes, environmental impact, and manufacturing costs.

And as it enables any electronic circuit to be formed on flexible circuit boards (soft films) in addition to rigid circuit boards, it is also anticipated that this wiring technology will lead to the next generation of devices.

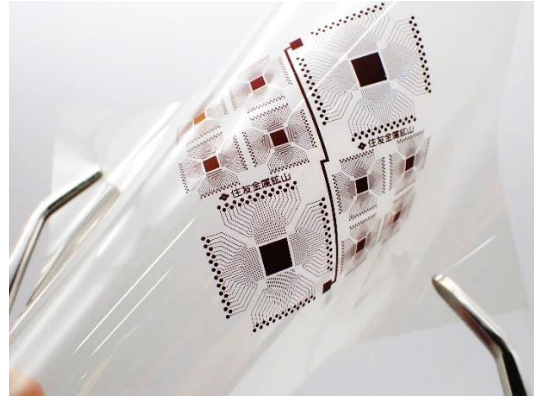
The thick film conductive ink that has been developed here is based on the metal complex ink developed by NIMS and Priways, and leverages the metal powder synthesis technology and paste technology of Sumitomo Metal Mining. To achieve the film thickness control and low temperature sinterability required in PE, the fine copper powder developed by Sumitomo Metal Mining is added to this ink. This enables thick-film wiring formation at around 200°C, meaning the technology can be used with heat-resistant resin films.

In addition to this, it is also more economical and more resistant against oxidization than standard conductive inks. The ink film can be made three or more times (\*2) thicker when printing and there is a little loss of resources, meaning it can meet the needs of devices with large current and area requirements.

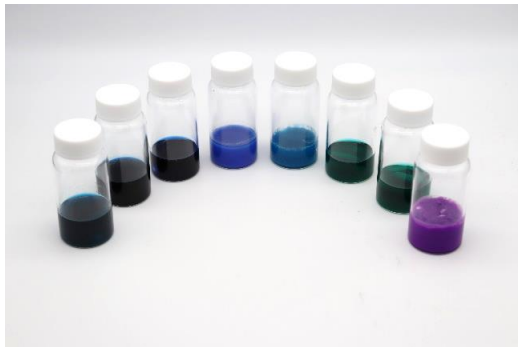
The Companies currently proceed development leveraging the technology of N.E. Chemcat Corporation and its strengths in metal complex development and manufacturing, aiming to the goal of process optimization and the establishment of mass production process. And going forward, the Companies will work to expand use of the ink and to improve its performance through dialog with customers.



Thick film conductive ink



A film substrate printed with thick film conductive ink



Metal complex ink that forms the base for thick film conductive ink



Fine copper powder

(\*1) Sumitomo Metal Mining will jointly exhibit with Shinko Co., Ltd., and Priways will jointly exhibit with C-INK Co., Ltd.

(\*2) Thick film conductive ink achieves a thickness of 30 or more micrometers in wiring with a width of 100 micrometers. This is more than three times thicker than with conventional metal complex ink to which copper powder has not been added, which has a thickness of 10 micrometers. (Research by Sumitomo Metal Mining, January 2024)

<Links>

Thick film conductive ink product page

[https://crossmining.smm.co.jp/en/material/copper\\_complex\\_hybridink/](https://crossmining.smm.co.jp/en/material/copper_complex_hybridink/)

Fine copper powder product page

[https://crossmining.smm.co.jp/en/material/fine\\_copper\\_powder/](https://crossmining.smm.co.jp/en/material/fine_copper_powder/)

[Development of an Oxidation-Resistant Copper Core–Nickel Shell Ink], published by NIMS on February 22, 2022

<https://www.nims.go.jp/eng/news/press/2022/02/202202220.html>

The NEPCON JAPAN 2024 Official Website

<https://www.nepconjapan.jp/tokyo/en-gb.html>