Transparent and conductive microstructures

In the field of transparent electrical conduction, several existing technologies make it possible to obtain an optically and electrically efficient material. Transparent conductive oxide layers such as ITO (indium tin oxide) are mainly used but have several limitations. ITO deposits require expensive vacuum equipment and are complex to produce for curved or flexible surfaces. The proposed technology is a relevant alternative to knocking down these locks while maintaining excellent electrical and optical properties.

DESCRIPTION*

- Process for laser insolation of a layer of metal oxalates:
  - Deposition of the oxalate layer: spin-coating, spray, spreading...
  - Localized low power laser insolation
  - Decomposition of metal oxalate at low temperature (below the melting point of the metal)
  - Removal / dissolution of unreacted oxalate
  - Obtaining patterns as metal mesh almost invisible
- Manufacturing of micrometric structures based on the metal of interest

Photo: ©TTT

TECHNICAL SPECIFICATIONS

Supported substrate type	Polymer (polyester, polycarbonate, POET,...), glass, silicon
E.g. of metals or alloys resulting from the manufacturing process	Fe, Co, Ni, Cu, Ag, Sn, Bi... or alloys
Line sheet resistance ($R_{\square}$)	0,25 ±0,05 Ω/□
Optical transparency (λ=550 nm)	85 %

COMPETITIVE ADVANTAGES

- Applicable on multi-supports (flat substrates, curves, flexible, transparent, with complex geometries...)
- Widening range of metal powders, oxides and metal-ceramic alloys
- Simplified manufacturing process
- Reduced laser acquisition cost (low power laser)

APPLICATIONS

- Displays
- Windshield
- Helmet
- Photovoltaic panels
- Electrical connectors
- Smart windows
- Glasses

INTELLECTUAL PROPERTY

- Patent pending

DEVELOPMENT STAGE

- Experimental proof of concept

1 2 **3** 4 5 6 7 8 9

LABORATORIES

INSTITUT CARNOT Chimie Balard Cirimat

LAAS CNRS

CONTACT

T. +33 (0)5 62 25 50 60
systemes@toulouse-tech-transfer.com
www.toulouse-tech-transfer.com

* Technology requiring license rights.