Surface Reformation of Insulating Resin
by Ultra Violet Treatment

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**What is the surface reformation method by UV irradiation?**

Pretreatment for electroless plating using UV irradiation as a substitute for etching

【Advantages】
- Enables formation of a conductive layer on a smooth resin surface
- Enables formation of a conductive layer on difficult to plate materials
- Environmentally friendly plating process
UV surface reformation method

Low pressure mercury Lamp

Air atmosphere

Insulating resin material

Irradiation Distance

184.9 nm: 8 mW/cm²
253.7 nm: 18 mW/cm²
Wiring patterns formed on modified surface

- Minimal damage to the resin surface
- Enable to form micro circuits
- Allows 10micron line and pitch space

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Effect of modified layer on adhesion strength

Without modification

Protection layer

Insulation Resin

No modification layer

Adequate adhesion strength is not obtained

With modification

Protection layer

Insulation Resin

Modified layer

More than 1.0 kN/m adhesion strength can be achieved
Mechanism for Adhesion

1. Insulation resin

2. Ozone is generated during irradiation of resin

3. The surface material is oxidatively cleaved, then eluted from resin to form nanoscale voids

4. Catalyst penetrates resin to form diffused catalyst layer

5. Nanoscale anchor layer is formed by electroless plating reaction which progressing from catalyst layer
Applicable materials

LCP, PI, COP, PA, Urethane, ABS. Nylon etc.

Application examples

Micro circuit pattern on smooth substrate

Form conductive layer on difficult to plate materials

Selective plating for fine pitch pattern

Environmentally-friendly Anisotropic conductive fine particles
Low Pressure UV Lamp

- 10nm - 380nm
- 200nm - 280nm
- 315nm
- UV-C, UV-A, UV-B, VUV

- 185nm Generate O³
- 254nm

【Application】
- Substrate cleaning, Water sterilizing, Deodorizing, Modification, Generating Ozone
High pressure UV Lamp

【Application】
Curing and drying for Inks, Paints, Adhesive materials, Resin coating etc.

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UV (Ultra Violet) Surface Treatment System
UV Surface Treatment System for 3 dimensional objects (KOL4-1200V)

Features
- Easily set irradiation speed. Just press Start button to clean and modify the surface of material
- Simple UV output and treatment temperature settings
- Enables UV irradiation while a material is rotating
- Supports material size up to 200×200×700(mm)

Specification
- Effective irradiated area: 200×200×700(mm)
- Irradiation distance: 15~100(mm)
- Lamp: High output low-pressure mercury lamp
- Footprint: W1000×D1000×H2350(mm)
- Utility: AC200V (50/60Hz) Exhaust duct
Small UV Surface Treatment System (KOL1-300)

Spec
【Effective irradiated area】150 × 150 (mm)
【Irradiation distance】5 〜 100 (mm)
【Lamp】High output low pressure mercury lamp
【Footprint】W360 × D550 × H530 (mm)
【Utility】AC200V (50/60Hz)

Accessories
- 300W low pressure mercury lamp (KOGLQ-300GS) 1pc
- Power source for the low pressure mercury lamp (KSG-302MHKT) 1 pc
- Connection cables
Roll-to-Roll UV Surface Treatment System
(KOL2-1200V/R)

Features
- Easily set irradiation speed and press Start button to clean and modify the surface of material
- Simple UV output and treatment temperature setting
- Enable UV treatment of various films by simply adjusting the tension of the rollers
- Support different material sizes (500mm wide or less, outer diameter Φ300 or less)

Specification
- Effective irradiation with: 500mm
- Irradiation distance: 10～30(mm)
- Lamp: High output low temperature
- Footprint: W2300×D1400×H1750(mm)
- Utility: AC200V(50/60Hz) Exhaust dust
UV Surface Treatment System (KOL4-600H/L)

Features
- Conveyor operation modes can be switched between continuous and intermittent for cleaning and property modification.
- Support up to 250 mm wide materials of sheets, films and exterior components.
- Applicable to heat sensitive materials by using cooling net.
- Real-time monitoring of the temperature inside the equipment is possible.

Specification
- Effective irradiated area: 250×500(mm)
- Irradiation distance: 15~100(mm)
- Lamp: High output low-pressure mercury lamp
- Footprint: W1800×D1620×H1360(mm)
- Utility: AC200V(50/60Hz) Exhaust duct
Thank you

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