

# CHASM AgeNT™ VC101

## Screen Printable Transparent Conductive Ink



### PRODUCT DESCRIPTION

VC101 is a carbon nanotube (CNT) ink designed for screen printing transparent conductors on a wide range of plastic films, without the need for rinsing operations or high-temperature baking to remove surfactants, rheology modifiers. VC101 has three main components:

1. conductive CNTs produced using CoMoCAT technology,
2. Nafion® binder to promote adhesion,
3. solvent-based ink vehicle made using V2VTM viscous-to-vapor technology developed by CHASM Advanced Materials.

### PRODUCT STRUCTURE

VC101 has three main components:

1. Best-in-class CNTs produced at CHASM
2. UV curable Acrylic Binder
3. Proprietary V2V™ (viscous-to-vapor) Ink Vehicle

### PRODUCT BENEFITS

- VC101 is screen printable and adheres well to typical polymer film substrates.
- Transparent conductors are environmentally stable, with neutral color and low haze (<0.5%).
- Transparent conductors are flexible / stretchable, and can even be thermoformed to create 3D touch sensor designs.
- VC101 is perfect for capacitive touch buttons and sliders to replace membrane switches in automotive interiors, home appliances, and medical devices, among other applications.

### PROPERTIES

Description	Properties
Physical Color	Black
Solids, ( % )	1.45
Viscosity, ( cP ) (Brookfield, 50 rpm, Spindle LV4-#64)	2,650
Theoretical Wet-film Thickness, ( $\mu\text{m}$ )	27
Theoretical Dry-film Thickness, ( $\mu\text{m}$ )	390
Ink Consumption, ( $\text{ml}/\text{m}^2$ ) (Dependent on % coverage, @ 50% coverage)	13.5

### TYPICAL OPTOELECTRONIC PROPERTIES

Description	Properties
Sheet Resistance, ( $\Omega/\square$ )	>1 M
Visible Light Transmittance, ( % )	98
Haze, ( % )	0.35
Adhesion Tape Test (3M Scotch Tape 600 on CHASM-AgeNT substrates)	No Transfer

### CONTACT INFORMATION

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# CHASM Ag<sup>e</sup>NT™ VC101

## Screen Printable Transparent Conductive Ink



### PROCESSING

- Screen Printing Equipment
- Semi-automatic flat-bed
- Automatic reel-to-reel flat-bed
- Manual

### SUBSTRATES

- CHASM-AGENT-AW210
- CHASM-AGENT-AW310
- CHASM-AGENT-AW321
- CHASM-AGENT-AW121

### SCREENS

- Mesh Type: Polyester
- Mesh Count: 305 TPI (120 T/cm)
- Thread Diameter: 34 µm
- Mesh Opening: 45 µm
- Emulsion Type: Solvent Resistant
- Emulsion Over Mesh: 12 µm Typical
- Overall Thickness: 53 µm
- % Open Area: 27 µm
- Emulsion Thickness: 0.5 mil
- Mesh Bias: 22°
- Screen Tension: 20 N/cm (Stretch & Glue)

### PRINTING

- Squeegee Type: 70 durometers
- Squeegee Angle: 80°
- Squeegee Speed: 100 mm/s
- Floodbar Speed: 150 mm/s
- Snap-off: 5 mm
- Peel: 5 mm
- Suitable exhaust over the printer is required, as alcohol & amines are irritants (refer to SDS)
- Operate press in flood / print mode. Only flood screen just before printing.
- Avoid adding excessive VC101 ink to the screen. Add fresh ink every 20-30 print images.
- Ventilation at the printer and infeed to the

dryer is required to keep operator exposure well below alcohol and amine exposure limits.

- 100 FPM face velocity for hood can eliminate the need for respirator. If amine odor can be detected, increase ventilation.

### DRYING AND CURING

3-Step Process\*:

1. Dry: 3 min @ 110°C
2. UV Cure (H Bulb)\*\*: 1.2 – 1.4 J/cm<sup>2</sup>
3. Thermal Cure: 3 min @ 110°C

\* Suitable exhaust for dryer & UV lamp is required (refer to SDS).

Avoid belt mesh drying patterns by using an insulating carrier film during drying

\*\* Use two (2) passes at 0.6 – 0.7 J/cm<sup>2</sup> per pass to achieve this total dose to avoid overheating.

### CLEANUP

- Immediately after printing last part, VC101 can be added back to ink container, to be used later.
- Solvent for cleanup: Isopropyl Alcohol.
- VC101 contaminated cloths & wipes, when dry, should be disposed of as solid industrial waste.

### STORAGE & SHELF LIFE

- Ink should be stored in the shipped container from CHASM, tightly sealed. It is safe to ship VC101 at 25°C, but for best performance and longest shelf-life, store at 0°C - 6°C (32° - 43°F).
- Prior to printing, refrigerated VC101 should acclimate to room temperature without external heating, to achieve consistent ink rheology.
- Shelf life of material in unopened containers is 12 months from the date of manufacture when refrigerated between 0°C - 6°C (32° - 43°F).

### SAFETY & HANDLING

For Safety and Handling information for this product, please refer to the Safety Data Sheet (SDS).

#### DISCLAIMER

The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on CHASM's accumulated experience as of the date of publication. Product performance will vary based on application and operational environment, so CHASM Advanced Materials Inc. is not liable for the suitability of our product for the intended applications and results.

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