


Advanced nanoGUARD

Non-toxic, environmentally friendly, fluorine-free replacement for fluorinated polymer electronic coatings

		FLURO-POLYMERS	TRADITIONAL CONFORMAL COATING	VAPOR DEPOSITION
REQUIREMENTS				
FULL PROTECTION	Passes OEM req.; undercoats	Masking; limited undercoat	Not 100%; no undercoat; masking	No UV dye; QC challenge
CONDENSATION / IMMERSION	Up to IPX8	Comparable to actnano	Not 100%	Not 100%
TOTAL COST	Lowest overall cost	PCBA cleaning required; masking	Masking; cure and difficult to rework	Expensive equipment; batch; mask; can't rework
SUSTAINABILITY/ HUMAN HEALTH	Non-toxic; fluorine-free; no forever chemicals	Contains PFAS; hazardous forever chemicals	Toxic chemicals	Harsh chemicals
OPERATING TEMP	-40 to 200 °C	Typical max +175 °C	Cracking and bubbling	Comparable to actnano
CURING	No curing required	No curing required	Thermal or UV cure process	No curing, Long process
THERMAL NEUTRALITY	Similar to non-coated	Comparable to actnano	Major heat entrapment; CTE concerns	Non-thermal neutral
MASKING	None; entire board 3D coverage	Limited	Masking required	Masking required
DESIGN CONSTRAINTS	No impact on design	Comparable to actnano	Not flexible; cracks	Comparable to actnano
CONNECT THROUGH	Gel-state connect through	Limited	Not feasible	Not feasible



The most advanced solution to replace your fluorinated polymer coatings for harsh electrical and environmental conditions



Advanced nanoGUARD coatings reach ready state within 30-60 seconds in ambient temperatures, requiring no ovens or curing process. Additionally, nanoGUARD's unique gel-state eliminates the need for masking connectors, contacts and components with connect-through capability and enables undercoating of components, including BGAs for 100% surface protection.

	ANG TITAN	FLUOROPOLYMERS
SOLVENT	C7 – C8 Isoalkanes 70 wt	Fluorinated solvent
VISCOSITY	2-5 cP @ 25° C	1-2 cP
COATING THICKNESS	5-100 µm (depending on required protection)	0.1 - 4.0 µm (depending on application method)
SOLVENT & CHEMICAL RESISTANCE	Resists a variety of fluids including water, saltwater, soapy water, Coke, Gatorade, coffee, salt, windshield washer fluid, coolant, mixed flowing gas, sweat	Resists a variety of solvents and chemicals
OPERATING TEMPERATURE	-40 to +200 °C	Up to 175 °C for 24 hours
T _g (GLASS TRANSITION TEMPERATURE)	No glass transition down between -60 and +200 °C	44-53 °C (127 °F)
CONTACT ANGLE (STATIC, WATER)	102°	105°
REWORKABILITY	Can be easily removed to repair and replace components	Requires fluorinated solvent to remove
NON-FLAMMABLE	Meets UL 94 V-0	Meets UL 94 V-0
COEFFICIENT OF THERMAL EXPANSION	ANG gel-state creates no inherent stress on components or solder joints	70-90 µm/(m· °C)
THERMAL CONDUCTIVITY	0.15-0.18 W/m·K	0.1 W/m·K
DIELECTRIC CONSTANT @30% RH PER ASTM D150	3.23 (@500 MHz)	3.2 (@1 kHz)