GALXYL® DIMER

FOR PARYLENE CONFORMAL COATINGS

GALENTIS

FINE CHEMICALS COMPANY

GALXYL® DIMER

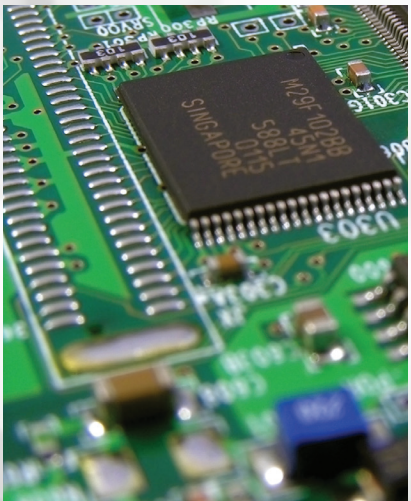
GALXYL dimer, manufactured by Galentis S.r.L., is the raw material used in the Parylene conformal coating process. The unique nature of the material's deposition enables the resultant Parylene coatings to reliably protect, preserve and insulate a wide variety of substrates.

Parylene coatings are ultra-thin and truly conformal and have been protecting components and devices in the aerospace, electronics, industrial, medical and military industries for decades. Due to their unique vapor deposition process, Parylene coatings protect even seemingly inaccessible areas, resulting in complete encapsulation of a substrate. Parylene films created with GALXYL C dimer are MIL-I-46058C and IPC-CC-830 approved and are an ideal solution for medical implantables due to their USP XXII, Class VI biocompatibility rating.

EXCELLENT PROPERTIES AND PROTECTION

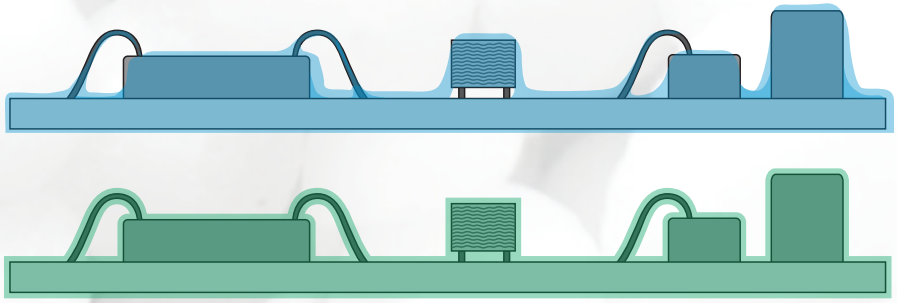
Parylene films created using GALXYL dimer offer many useful and beneficial properties to design engineers:

- Ultra-thin coatings ranging from 0.01 to 100 microns
- Lightweight, stress-free
- Completely uniform; no pooling or edge-effects
- Optically clear
- Unrivaled barrier properties with low permeability to gases and moisture
- Superior dielectric strength for electrical insulation
- Barrier resistance to acids, alkalis and solvents
- Biocompatibility
- Thermal stability up to 275°C (in the absence of oxygen)
- Cryogenic resistance down to -200°C
- Resistant to fungus and bacteria
- Dry film lubricity
- Increases mechanical strength of underlying components



DEPOSITION PROCESS

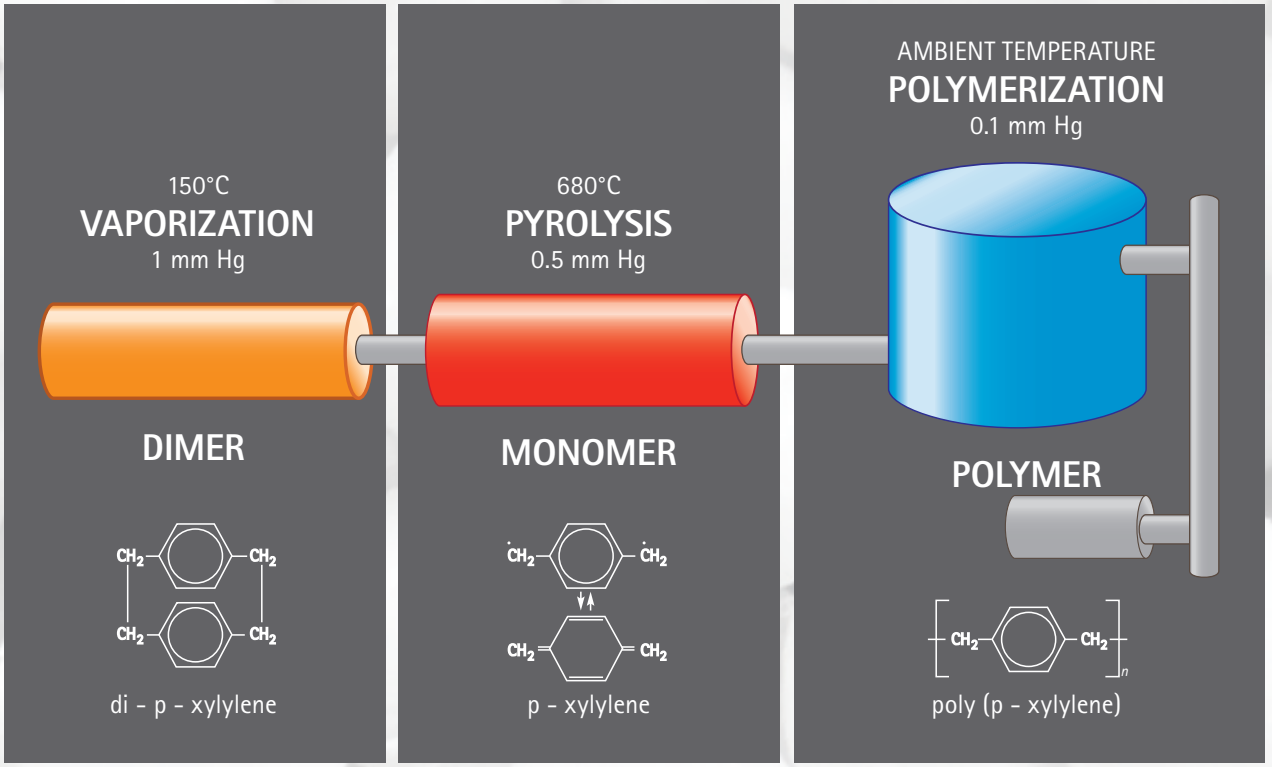
Parylene coatings are formed with GALXYL dimer via a deposition process that occurs at the molecular level. As a result, any sharp edges, crevices, pores and recessed areas on a substrate are all covered by a uniform thickness of Parylene film. The coating is formed in-situ on the substrate surface, regardless of the substrate's complexity.



LIQUID COATING

PARYLENE COATING

The vapor deposition polymerization process of GALXYL Parylene N film is illustrated below. The process begins as GALXYL dimer vaporizes under vacuum at 150-170°C. The vapor then passes through the pyrolysis zone (680°C) where a monomer vapor is formed. When the monomer molecules enter the deposition chamber (at 0.1 mm Hg), they find the substrate at ambient temperature. Condensation of the reactive monomer occurs on the substrate and, since molecules are very close to one another, polymerization simultaneously takes place. The resulting polymer is linear and highly crystalline.



GALXYL® DIMER

FORMS PARYLENE FILMS THAT FEATURE OUTSTANDING PROPERTIES

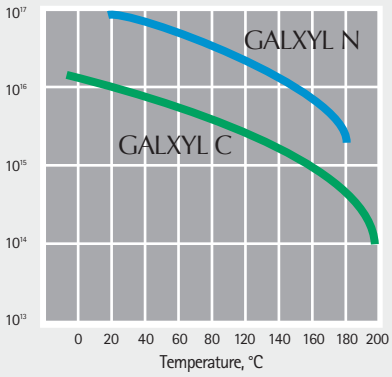
TYPICAL PROPERTIES OF GALXYL FILMS

Data recorded following appropriate ASTM method.

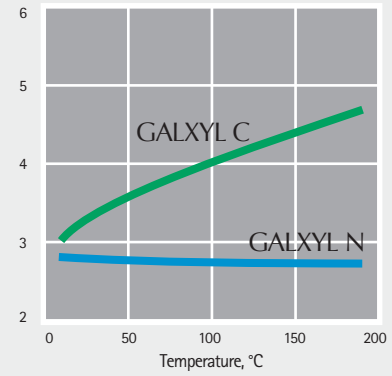
	GALXYL N	GALXYL C
TYPICAL PHYSICAL AND MECHANICAL PROPERTIES		
Tensile strength, psi	6,500	10,000
Tensile strength, MPa	45	69
Yield strength, psi	6,300	8,000
Yield strength, MPa	43	55
Tensile modulus, MPa	2,400	3,200
Elongation at break, %	40	200
Yield elongation, %	2.5	2.9
Density, g/cm^3	1.110	1.289
Coefficient of friction: static	0.25	0.29
dynamic	0.25	0.29
Water absorption (24 hr), %	0.01	0.06
Index of refraction, n_D^{23}	1.661	1.639
TYPICAL ELECTRICAL PROPERTIES		
Dielectric strength, short time (Volts/mil at 1 mil)	7,000	5,600
Volume resistivity, 23°C, 50% RH (Ohm-cm)	1 x 10^{17}	6 x 10^{16}
Surface resistivity, 23°C, 50% RH (Ohms)	1 x 10^{15}	1 x 10^{15}
Dielectric constant: 60 Hz	2.65	3.15
1,000 Hz	2.65	3.10
1,000,000 Hz	2.65	2.95
Dissipation factor: 60 Hz	0.0002	0.020
1,000 Hz	0.0002	0.019
1,000,000 Hz	0.0006	0.013
TYPICAL BARRIER PROPERTIES		
Gas permeability*		
Nitrogen	7.7	0.95
Oxygen	30	7.1
Carbon dioxide	214	7.7
Hydrogen sulfide	795	13
Sulphur dioxide	1890	11
Chlorine	74	0.35
Moisture vapor transmission**	1.50	0.50
TYPICAL THERMAL PROPERTIES		
Melting temperature, °C	410	290
Linear coefficient of expansion, 10^{-5}/°C	6.9	3.5
Thermal conductivity, 10^{-4} (cal/sec) / (cm² • °C/cm)	3	2

1 mil = 1/1000 in = 25.4 microns
* cm^3 - mil/100 in^2 - 24 hr - atm (23°C)
** g - mil/100 in^2 - 24 hr, 37°C, 90% RH

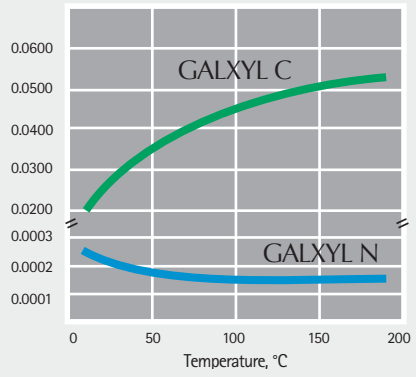
VOLUME RESISTIVITY



DIELECTRIC CONSTANT



DISSIPATION FACTOR



Manufactured by:

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