PARYLENE

Conformal Coatings for Critical Performance Applications

PARYLENE COATING PROCESS

- Thin Film
- Pinhole Free
- Electrically Insulating
- Reduced Friction
- Chemical and Solvent Resistance
- Medical Applications

Typical Industries

- Military Electronics (Qualified to MIL-I-46058C)
- Marine and Related Environments
- Medical Device Applications
- Rubber Seals, Gaskets, Tubing and O-rings
- Commercial Electronics

Compatibility & Performance

- Hydrophobic
- Compatible with Elastomers
- Low Outgassing Properties
- High Dielectric Strength
- USP Class VI Biocompatibility

PROPERTIES

High reliability - Suitable for both military and commercial applications

Particle retention - Upgrades electronic and mechanical devices

True conformality - Uniform thickness on all surfaces

Out gassing - Virtually none

Light weight - compared to other coatings

Solvent resistance - Insoluble in common solvents

Wide temperature range - From -220 C to +150 C

Outstanding barrier - Very low permeability to moisture and gases

Stress-free coatings - Sensitive circuitry unchanged by coating

Acid and base resistance - Resists attack from exposure

Radiation resistance - Suitable for space applications

Fungus and bacteria resistance - Excellent

Low coefficient of friction - Outstanding lubricity

Electrical breakdown - Extremely high dielectric strength

Transparency - thin films are of optical clarity

Mechanical - High tensile and yield strength

FACILITY LOCATIONS:

UNITED STATES:

E/M Chicago	630-620-6808
E/M Detroit	586-566-6800
MIC Fremont, IN	260-495-4445
E/M Hartford	860-224-9148
E/M Minneapolis	651-780-3202
E/M Los Angeles (No. Hollywood)	818-983-1952
(Chatsworth)	818-407-6280
MIC Philadelphia	215-638-0888
PCS Katy, TX	281-391-7765

CANADA:

MIC Ingersoll	519-485-5500

CHINA:

MIC Suzhou	86-158-6241-7890

GERMANY:

MIC Unna	49-2303-91880

UNITED KINGDOM:

MIC Evesham	44-1386-421444

IRELAND:

MIC Evesham	353-91-780-300

E/M COATING SERVICES

CURTISS WRIGHT

mi

PCS SM

TECHNICAL SPECIFICATIONS

TYPICAL FILM PROPERTIES	Parylene N	Parylene C	Parylene D
Physical & Mechanical Properties			
Tensile strength, psi	6,500	10,000	11,000
Tensile strength, Mpa	45	69	76
Yield strength, psi	6,300	8,000	9,000
Yield strength, Mpa	43	55	62
Tensile modulus, Mpa	2,400	3,200	2800
Elongation to break, %	40	200	10
Density, g/cm2	1,110	1,289	1,418
Coefficient of friction			
static	0.25	0.29	0.33
dynamic	0.25	0.29	0.31
Water absorption, % (24 hr)	0.01 (0.019")	0.06 (0.029")	NA
Index of refraction, Nd23	1.661	1.639	1.669
Typical Electrical Properties			
Dielectric strength, (Volts/mil at 1 mil)	7,000	6,800	5,500
Volume resistivity, 23 C, 50% RH (Ohm-cm)	1 x 10 to the 17th	6 x 10 to the 16th	2 x 10 to the 16th
Surface resistivity, 23 C, 50% RH (Ohms)	10 to the 15th	10 to the 15th	10 to the 16th
Dielectric constant: 60 Hz	2.65	3.15	2.84
1,000 Hz	2.65	3.1	2.82
1,000,000 Hz	2.65	2.95	2.8
Dissipation factor: 60 Hz	0.0002	0.02	0.004
1,000 Hz	0.0002	p.p.19	0.003
1,000,000 Hz	0.0006	0.013	0.002
Typical Barrier Properties			
GAS PERMEABILITY			
Nitrogen	7.7	0.95	4.5
Oxygen	30	7.1	32
Carbon dioxide	214	7.7	13
Hydrogen sulfide	795	13	1.45
Sulphur dioxide	1.89	11	4.75
Chlorine	74	0.35	0.55
MOISTURE VAPOR TRANSMISSION	1.5	0.14	0.25
TYPICAL THERMAL PROPERTIES			
Melting temperature (degrees C)			
Linear coefficient of expansion,	410	290	380
(10 to the -5th/C)	6.9	3.5	NA
Thermal conductivity,			
(10 to the -4th (cal/sec)/(cm squared C/ C)	3	2	NA