

Technica

Adhesive & Surface Technology

Parylene at the Coating Centre of APM Technica AG

- “ Protection against corrosion
- “ Extremely high electrical breakdown voltage
- “ Low dielectric constant
- “ Low friction
- “ Protection against abrasion

- “ Absolutely conformal coating
- “ Process temperature < 50° C
- “ Gap penetration
- “ USP VI
- “ FDA MAF



Process Know-how at APM Technica AG

Key know-how:

Understanding surface treatments, coatings and adhesive technologies.

Coating technologies:

- Functional wet-chemical coatings
- Optical coatings
- Parylene coatings

Supporting infrastructure:

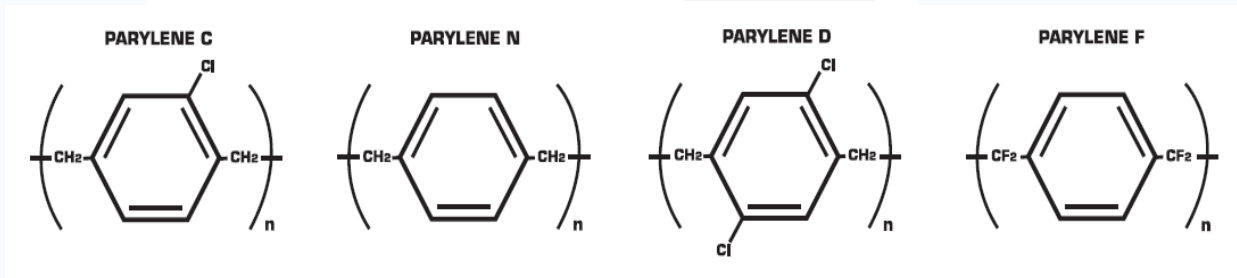
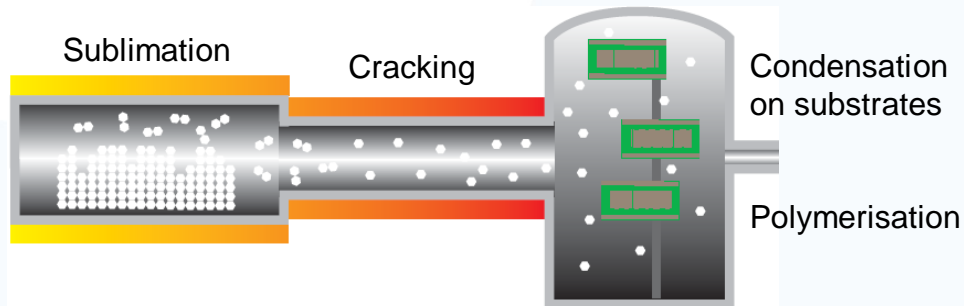
- Environmental simulation
- Chemistry laboratory
- Physics laboratory
- Microscopy



What is Parylene?

Inert dimer which can be sublimated

Chemical vapor deposition (CVD):



Additional processes:

- Cleaning
- Plasma treatment
- Priming

Properties of Parylene

Parylene:	Type C	Type N	Type D	Type F
Melting temperature [°C]	290	410	380	>460
Operating temperature [°C]	125	90	160	350
Temporary peak temperature [°C]	200	120	300	450
Tensile strength [Mpa]	69	45	76	52
Creep strength [Mpa]	55	43	62	34
Young's modulus [Mpa]	3200	2400	2800	2500
Elongation at break [%]	200	250	200	200
Density [g/cm³]	1289	1110	1418	1.32
Static friction coefficient	0.29	0.25	0.33	0.31
Dynamic friction coefficient	0.29	0.25	0.31	0.13
Index of refraction, n_D²³	1.639	1.661	1.669	1.559
Electric breakdown voltage [V/mil]	5800	7000	5500	5500
Specific resistivity [Ohm.cm] ^{23°C,50%RL}	6x10 ¹⁶	1x10 ¹⁷	2x10 ¹⁶	2x10 ¹⁷
Surface resistivity [Ohm] ^{23°C,50%RL}	1x10 ¹⁵	1x10 ¹⁵	5x10 ¹⁶	5x10 ¹⁵
Dielectric constant @ 60Hz	3.15	2.65	2.84	2.25
N₂- permeability	0.37	7.7	1.77	4.85
O₂- permeability	2.8	11.81	12.6	23.5
Humidity permeability	0.06	0.59	0.1	0.23
Hydrochloric acid 10% resistance ^{75°C / 120Min}	-0.28	0.08	0.21	n/a
Sulfuric acid 10% resistance ^{75°C / 120Min}	-0.28	0.07	0.14	n/a
Acetone resistance ^{50°C / 120Min}	-0.09	0.15	2.38	n/a