



## SEMIKON SERIES MATERIALS

Symmtek's **Semikon** molded polymer products are a series of electrostatic dissipative and/or conductive compression molded polymers, designed for static management applications up to service temperatures of 500F in the semiconductor and solar-cell manufacturing industries. The filler/reinforcement packages in the Semikon product line impart high strength and stiffness over a wide temperature range while preventing discharge to or from human contact. Semikon products are compression molded ensuring minimal residual stress in the molded shapes, guaranteeing ease of machining to hold very tight tolerances required for components in semiconductor device manufacturing equipment. The products are available in rod, tube, and plate and in several resins for very different performances: Polyamide-imide (PAI), Polyether-imide (PEI), Poly-ether-ether-ketone (PEEK), and Poly-Aryl-sulfone (PAS) (PPSU).

### Applications/Grades:

**41-ESD-CON:** Polyetherimide (PEI) polymer product designed for use in the semiconductor industry, offering electrostatic dissipation to preserve sensitive microchip integrity during assembly and manufacturing. Product offers consistent surface resistivity with no or very low initial charge through a wide range of temperatures up to 340 °F providing a path for an electrostatic charge to bleed-off. 41-ESD-CON is a compression molded and fully annealed product with a high degree of dimensional stability during and after machining of intricate components. The product is available in rod, tube and plate.

**42-ESD:** an electrostatic dissipative Polyetherimide (PEI) polymer product designed for static management applications up to 340 °F in the semiconductor and solar-cell industries. The filler package in the Polyetherimide resin imparts high strength and stiffness over a wide temperature range while preventing discharge to or from human contact. 42-ESD is a compression molded, and fully annealed PEI product offering high degree of dimensional stability during and after machining of intricate components. The product is available in rod, tube, and plate.

**48-ESD:** a static dissipative Polyetheretherketone (PEEK) polymer product designed for static management applications requiring higher thermal performance in an ESD product up to 450-475 °F. Product maintains strength and stiffness, and prevents discharge to or from human contact during assembly and packaging operations. 48-ESD is a compression molded, and fully annealed PEEK product offering high degree of dimensional stability during and after machining of intricate components. The product is available in rod, tube and plate. P

**48-ESD:** an anti-static fiber reinforced Polyamide-imide polymer product with thermal stability up to 500 °F. The fiber reinforcement offers high stiffness and deformation resistance up to its maximum service temperature. The product provides suppression of electrostatic charging in test sockets, nests, and fixtures in semiconductor and electronic testing equipment. The static dissipative properties, stiffness at temperature, and dimensional stability of T-230-AS makes the product ideal for electronic and semiconductor device handling components. Semikon-T-230-AS is compression molded and fully annealed PAI product with a high degree of dimensional stability during and after machining of intricate components. The product is available in rod, tube and plate.

Corrosion resistance charts will be sent upon request. If your application demands other fillers or reinforcements different than those listed as standard, Symmtek can provide custom molded compounds to meet your specific needs.



**Summary Of Typical Properties  
– Semikon Series Material –**

	Properties	Units	Test Method	41-ESD-CON	42-ESD	48-ESD	T-230-AS
<b>Physical</b>	Specific Gravity	g/cc	ASTM D-792	1.41	1.52	1.47	1.6
	Water Absorption						
	24 hours		ASTM D-570	0.30%	0.20%	0.20%	0.58%
	48 hours		ASTM D-570	1.10%	1.50%	1.80%	4.2%
<b>Mechanical</b>	Tensile Strength @ 75°F	psi	ASTM D-638	9,500	9,100	15,000	11,000
	Tensile Modulus	psi	ASTM D-638	900,000	910,000	950,000	790,000
	Tensile Elongation	%	ASTM D-638	2.5%	1.50%	1.70%	3.0%
	Flexural Strength	psi	ASTM D-790	12,600	15,800	22,000	19,750
	Flexural Yield Modulus	psi	ASTM D-790	900,000	910,000	1,200,000	800,000
	Compressive Strength	psi	ASTM D-695	20,000	22,300	27,000	28,300
	Compressive Modulus	psi	ASTM D-695	580,000	580,000	580,000	600,000
	Izod Impact Strength Notched	ft*lb/in	ASTM D-256	0.9	0.6	1.2	0.8
	Coefficient of Friction		Dry vs. Steel, QTM 55007	0.2	n/a	0.2	0.2
	Hardness, Rockwell M		ASTM D-785	115	120	105	108
Hardness, Rockwell R		ASTM D-785	125	n/a	120	n/a	
<b>Thermal</b>	CTE, Linear 68 °F	in/in/°F	ASTM E381	1.9	1.6	1.6	2.85
	Max Service Temperature, Air	°F	Long Term	338	338	475	500
	Heat Deflection Temperature	°F	ASTM D-648	410	392	500	520
	Glass Temperature	°F	ASTM D-3418	410	420.0	644.0	527
	Flammability, UL94	V-0	1/8in	V-0	V-0	V-0	V-0
<b>Electrical</b>	Surface Resistivity per Square	ohms	ANSI/EOS/ESD S11.11	1.00E+05	1e+006 - 1e+009	1e+006-1e+009	1.00e+10-1.00e+12
	Dissipation Factor	10^6 Hz	ASTM D-150	0.001	n/a	0.518	0.182
	Dielectric Constant	10^6 Hz	ASTM D-150	3	n/a	10.9	5.76
	Dielectric Strength	V/mil	ASTM D-150	n/a	n/a	n/a	475

To be best of our knowledge the information contained herein is accurate. However, neither Symmtek Polymers LLC, nor its affiliates assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability and whether there is any infringement of patents is the sole responsibility of the user.

Symmtek Polymers LLC  
123 Gantry Lane  
Calera, OK 74730  
(303) 670-8820