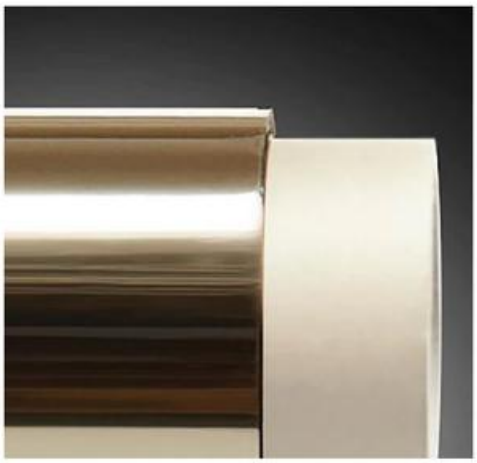
ELECTRICALLY INSULATING FILMS

KARL SCHUPP AG

CONDUCT – PROTECT – INSULATE



These films are non-reinforced and semi-crystalline from PEEK™ polyether ether ketone polymer. They offer engineers a material solution for high-performance applications. They have a unique combination of properties such as high temperature resistance, low weight, mechanical strength, durability, excellent radiation, hydrolysis and chemical resistance, electrical insulation, abrasion and wear resistance, excellent barrier properties with high purity, flame retardant without the use of flame retardants, low toxicity of combustion products and low moisture absorption. The inherently flame-retardant films are easy to process.

PEEK Electrical Films

Application examples:

Industry	**Aerospace**
Electrical insulation	Pressure sensors
Adhesive tapes	Speaker cones and voice coils
Printed circuit board substrates	Capacitors
High-temperature labels	Composite structures
Sealing washers in high-speed engines	Suitable for use with lead-free solders
Sealing washers in cell phone hinges	
Flexible heating elements	

Standard thicknesses and widths:

The standard width of the film is 610 mm - widths up to 1500 mm on request. Standard thicknesses (in µm) - 12, 18, 25, 38, 50, 63, 75, 100, 125, 150, 200. Other thicknesses 250, 300, 500, 750 µm on request. The thickness tolerance is +/- 7 %.

Minimum purchase quantity 10 kg	25 µm	50 µm	75 µm	100 µm	150 µm	200 µm	300 µm	500 µm
Surface area [m2]	approx. 300	approx. 160	approx. 100	approx. 80	approx. 50	approx. 40	approx.26	approx.15

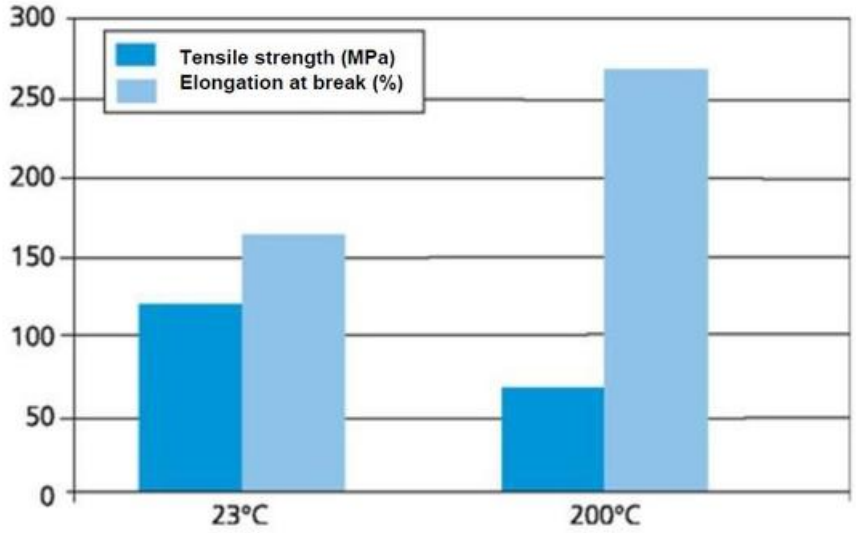


Figure 1: Physical properties at 23 °C and 200 °C for film, 50 µm (ISO 527)

Mechanical properties with different film thicknesses:

ISO 527 at 23 °C					
25 µm	50 µm	125 µm	250 µm		
Tensile strength	MPa	130	120	110	100
E-modulus	GPa	3.0	2.8	2.4	2.2
Tear elongation	%	>150	>150	>150	>150

Electrical properties with different film thicknesses:

ATSM D149, 23°C, 1/4" electrode					
		25 µm	50 µm	125 µm	250 µm
Dielectric strength	kV/mm	270	190	120	70
Breakdown voltage	kV	6.75	9.5	15	17.5

Test method	Test Condition	Unit	50 µm	
Property				
E-modulus	ISO 527	23 °C	GPa	2,8
Tensile strength (at break)	ISO 527	23 °C	M Pa	120
Tear elongation	ISO 527	23 °C	%	>150
Puncture resistance	Def Stan 81-75	23 °C	kJ/m2	26
Tear strength	ISO 6383-1	23 °C	N/m m	6,7
Shrinkage	TM-VX-84	200 °C	%	<2
Density	ISO 1183	23 °C	kg/dm3	1,30
Water absorption (50 % relative humidity)	ISO 62	23 °C, 24h	%	0,04
Linear coefficient of thermal expansion	ASTM D696	MD, below Tg	ppm	47
Dielectric strength	ASTM D149	23 °C, 1/4" electrode	kV/mm	190
Contact resistance	ASTM D257	100 V, 23 °C	Ohm cm	4 x 1016
Dielectric constant	ASTM D150	23 °C, 10 MHz	-	3,5
Loss factor tan δ	ASTM D150	23 °C, 10 MHz	-	0,002