



VICTREX® PEEK FILM TECHNOLOGY

APTIV® 1000 Series Films

Description

APTIV® 1000 series films are the unfilled semi-crystalline films made from VICTREX® PEEK polymer. The film provides a material solution for engineers in ultra-high performance applications.

APTIV films are a comprehensive range of versatile, high-performance films, the use of which can facilitate reduced systems costs, improved performance and enhanced design freedom.

APTIV 1000 has a unique combination of properties providing high temperature performance, lightweight, mechanical strength, durability, excellent radiation, hydrolysis and chemical resistance, electrical insulation, wear and abrasion resistance, excellent barrier properties with high purity, good flammability without the use of flame retardants, low toxicity of combustion products, and low moisture absorption in a film format. Inherently halogen-free and ease of processing makes APTIV films a technology enabler for our customers and end users.

Availability

The films are available in thicknesses from 8 microns up to 750 microns.

Applications

- Electrical insulation
- Pressure sensitive tapes
- Printed circuit substrates
- High temperature labels
- Washers in high speed motors
- Washers in mobile phone hinges
- Flexible surface heaters
- Aerospace insulation
- Pressure sensor membranes
- Acoustic speaker diaphragms
- Capacitors
- Composites
- Proven temperature resistance to use of lead free solders

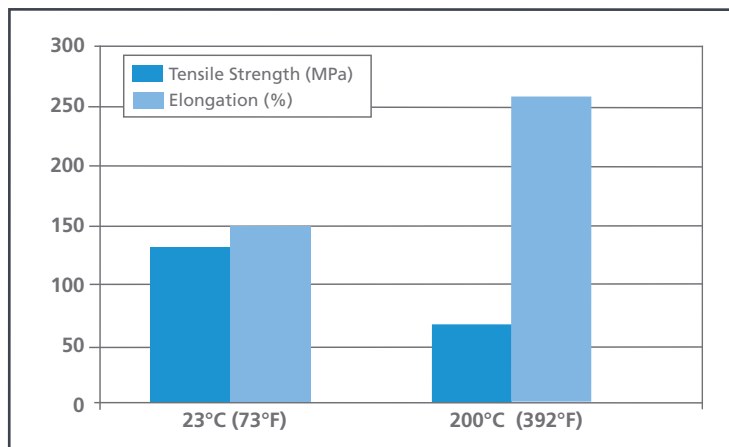
Certification

APTIV film is FDA and EU approved for food contact and is RoHS and 3A Sanitary Standards compliant.

Features

- High heat resistance
- Excellent tribological properties
- Broad chemical resistance
- Low moisture absorption
- High strength and toughness
- Stable, excellent electrical insulation properties
- Good flammability performance without use of flame retardant additives
- Inherently halogen-free
- Radiation resistance
- Low smoke and toxic gas emission
- Excellent hydrolysis resistance
- Excellent barrier properties
- Excellent acoustic properties
- High purity
- Lightweight
- Recyclable
- Easy to process – can be laminated to other materials, thermoformed, metallised, coated, printed, stamped and die cut, welded and heat sealed and coated.

Figure 1: Physical Properties at 23°C (73°F) and 200°C (392°F) for APTIV 1000, 50 microns (MD)



Standard Thicknesses and Widths

The standard width for film is 610mm (approx. 24in) – widths up to 1400mm (approx. 55in) available upon request.

Standard thicknesses available (in microns) — 8, 18, 25, 50, 100, 125, 150, 200, 250, 300, 500, and 650. Please enquire for other thicknesses up to 750 microns.

Standard thickness tolerance is better than +/-7% for all grades except under 10 microns which is better than +/-1.0 micron.

Surface Finishes

Standard surface finish is gloss/gloss, although matt/gloss is available on request. Typical Ra values can be supplied on request.

Custom Finishing (Slitting and Surface Treatment)

The slitter capability in the APTIV film facility allows custom lengths and widths down to 50mm (approx. 2in) to be produced. Widths below 50mm (approx. 2in) are available on request. Surface treatment by atmospheric plasma process of the film is also available by request taking the surface energy of the treated APTIV film surface to greater than 55 dynes/cm. [A minimum order quantity or value applies.]

Mechanical Properties at Various Thicknesses

ISO 527 at 23°C (73°F)

Property	Units	25µm		50µm		125µm		250µm	
		MD	TD	MD	TD	MD	TD	MD	TD
Tensile Modulus	GPa(kpsi)	2.6(377)	2.8(4.6)	2.5(363)	2.5(363)	2.3(334)	2.3(334)	2.3(334)	2.3(334)
Tensile Strength (at break)	MPa(kpsi)	140(20.3)	120(17.4)	130(18.9)	120(17.4)	120(17.4)	120(17.4)	110(16.0)	110(16.0)
Tensile Elongation (at break)	%	>150	>150	>150	>150	>150	>150	>150	>150

Electrical Properties at Various Thicknesses

ATSM D149, 23°C (73°F), 6.25mm (0.25in) electrode

		25µm	50µm	125µm	250µm
Dielectric Strength	kV/mm (V/mil)	270 (6858)	190 (4826)	120 (3048)	70 (1778)
Breakdown Voltage	kV	6.75	9.5	15	17.5

APTIV 1000 acts as an excellent electrical insulator across a wide range of temperatures and electrical frequencies.

Packaging and Storage

APTIV film is supplied in roll form on high quality, resin coated and polished fibre cores with an inner diameter of 76mm (approx. 3in) or 152mm (approx. 6in). These cores are a Class A standard core. APTIV film is very stable and will retain its properties for several years when stored in the original packaging in a frost free environment up to 50°C (122°F). APTIV film is unaffected by humidity and is unaffected by moisture. The rolls should be stored in a weathertight facility so that the packaging is not damaged.

Disposal

APTIV film is classed as a non-hazardous material and can be disposed of by landfill.

Labelling of Products

All products are packaged using robust and purpose designed packaging, and are fully labelled to comply with national and international standards. Labels indicating grade, unique batch number, roll length, roll width, product thickness, and net weight will be affixed to the outer packaging and the core.

Units of Sale

Orders for APTIV film should be placed in kilograms or imperial pounds.

Property	Test Method	Test Condition	Units	1000-050G	
				MD	TD
Tensile Modulus	ISO 527	23°C (73°F)	GPa (kpsi)	2.5 (363)	2.5 (363)
Tensile Strength (at break)	ISO 527	23°C (73°F)	MPa (kpsi)	130 (18.9)	120 (17.4)
Tensile Elongation (at break)	ISO 527	23°C (73°F)	%	>150	>150
Puncture Strength	Def Stan 81-75	23°C (74°F)	kJ/m ² (cal/ft ²)	26 (577)	
Tear Strength	ISO 6383-1	23°C (73°F)	N/mm (lb/in)	6 (34)	8 (45)
Shrinkage	TM-VX-84	200°C (392°F)	%	≤0.5	≤0.5
Water Absorption (50% RH)	ISO 62	23°C (73°F), 24h	%	0.04	
Specific Gravity	ISO 1183	23°C (73°F)		1.3	
Coefficient of Linear Thermal Expansion	ASTM D696	MD, below T _g	ppm/°C	47	
Dielectric Strength	ASTM D149 6.35mm (0.25in) electrode	23°C (73°F)	kV/mm (V/mil)	190 (4826)	
Dielectric Constant	ASTM D150	23°C (73°F), 10 MHz		3.5	
Loss Tangent	ASTM D150	23°C (73°F), 10 MHz		0.002	
Volume Resistivity	ASTM D257	23°C (73°F), 100V	Ohm cm	4.00E +16	

Compliances

APTIV 1000 film is approved for Food Contact Use:

- APTIV 1000 film is compliant with the compositional requirements of FDA 21 CFR 177.2415.
- APTIV 1000 film is compliant with the framework regulation (EC) No. 1935/2004/EC and commission directive 2002/72/EC and the amendments up to 2005/79/EC.
- APTIV 1000 film is fully compliant with the 3-A Sanitary Standards.

APTIV 1000 film complies with the requirements of RoHS European Directive 2002/95/EC and can be used to manufacture products compliant with the same directive.

APTIV 1000 film is inherently halogen-free in accordance with IEC61249-2-21.

Secondary Processes

APTIV 1000 film can easily be subjected to a range of secondary process operations, which allow designers and engineers to obtain the benefits of APTIV film properties in a variety of forms.

- Surface treatment
- Adhesion
- Coatings
- Heat welding and heat sealing
- Metallisation
- Laser marking and machining
- Slitting
- Die cutting and stamping
- Thermal lamination
- Thermoforming
- Printing

www.aptivfilms.com



Victrex Polymer Solutions, a division of Victrex plc, is the world's leading manufacturer of Polyaryletherketones, high performance polymers, which are sold under the brand names VICTREX® PEEK polymer, VICOTE® Coatings, APTIV® films and VICTREX Pipes™. With production facilities in the UK backed by sales and distribution centres serving more than 30 countries worldwide, our global market development, sales, and technical support services work hand-in-hand with OEMs, designers and processors offering assistance in the areas of processing, design and application development to help them achieve new levels of cost savings, quality, and performance.

World Headquarters

Victrex plc
Hillhouse International
Thornton Cleveleys
Lancashire FY5 4QD
United Kingdom
Tel: + (44) 1253 897700
Fax: + (44) 1253 897701
Email: victrexplc@victrex.com

Americas

Victrex USA Inc
300 Conshohocken State Road
Suite 120
West Conshohocken, PA 19428
USA
Tel: + (1) 800-VICTREX
Tel: + (1) 484-342-6001
Fax: + (1) 484-342-6002
Email: americas@victrex.com

Europe

Victrex Europa GmbH
Langgasse 16
65719 Hofheim/Ts.
Germany
Tel: + (49) 6192 96490
Fax: + (49) 6192 964948
Email: eurosales@victrex.com

Asia Pacific

Victrex Japan Inc.
Mita Kokusai Building Annex
4-28, Mita 1-chome
Minato-ku
Tokyo 108-0073
Japan
Tel: +81 (0)3 5427 4650
Fax: +81 (0)3 5427 4651
Email: japansales@victrex.com

Asia Pacific

Victrex High Performance
Materials (Shanghai) Co Ltd
Part B Building G
No. 1688 Zhuanxing Road
Xinzhuang Industry Park
Shanghai 201108
China
Tel: + (86) 21-6113 6900
Fax: + (86) 21-6113 6901
Email: scsales@victrex.com

VICTREX PLC BELIEVES THAT THE INFORMATION CONTAINED IN THIS BROCHURE IS AN ACCURATE DESCRIPTION OF THE TYPICAL CHARACTERISTICS AND/OR USES OF THE PRODUCT OR PRODUCTS, BUT IT IS THE CUSTOMER'S RESPONSIBILITY TO THOROUGHLY TEST THE PRODUCT IN EACH SPECIFIC APPLICATION TO DETERMINE ITS PERFORMANCE, EFFICACY AND SAFETY FOR EACH END-USE PRODUCT, DEVICE OR OTHER APPLICATION. SUGGESTIONS OF USES SHOULD NOT BE TAKEN AS INDUCEMENTS TO INFRINGE ANY PARTICULAR PATENT. THE INFORMATION AND DATA CONTAINED HEREIN ARE BASED ON INFORMATION WE BELIEVE RELIABLE. MENTION OF A PRODUCT IN THIS DOCUMENTATION IS NOT A GUARANTEE OF AVAILABILITY. VICTREX PLC RESERVES THE RIGHT TO MODIFY PRODUCTS, SPECIFICATIONS AND/OR PACKAGING AS PART OF A CONTINUOUS PROGRAM OF PRODUCT DEVELOPMENT. VICTREX® IS A REGISTERED TRADEMARK OF VICTREX MANUFACTURING LIMITED. VICTREX PIPES™ IS A TRADEMARK OF VICTREX MANUFACTURING LIMITED. PEEK-ESD™, HT™, ST™ AND WG™ ARE TRADEMARKS OF VICTREX PLC. VICOTE® AND APTIV® ARE REGISTERED TRADEMARKS OF VICTREX PLC.

VICTREX PLC MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, A WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR OF INTELLECTUAL PROPERTY NON-INFRINGEMENT, INCLUDING, BUT NOT LIMITED TO PATENT NON-INFRINGEMENT, WHICH ARE EXPRESSLY DISCLAIMED, WHETHER EXPRESS OR IMPLIED, IN FACT OR BY LAW. FURTHER, VICTREX PLC MAKES NO WARRANTY TO YOUR CUSTOMERS OR AGENTS, AND HAS NOT AUTHORIZED ANYONE TO MAKE ANY REPRESENTATION OR WARRANTY OTHER THAN AS PROVIDED ABOVE. VICTREX PLC SHALL IN NO EVENT BE LIABLE FOR ANY GENERAL, INDIRECT, SPECIAL, CONSEQUENTIAL, PUNITIVE, INCIDENTAL OR SIMILAR DAMAGES, INCLUDING WITHOUT LIMITATION, DAMAGES FOR HARM TO BUSINESS, LOST PROFITS OR LOST SAVINGS, EVEN IF VICTREX HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, REGARDLESS OF THE FORM OF ACTION.

