

Fiber Technologies Fluoroadditives

Fiber Technologies AP101 and AP202 fluoroadditives are homogenous blends of Polytetrafluoroethylene (PTFE) and surfactants and/or processing aids. These fluoroadditives are different from well-known Teflon® molding and extrusion powders. Fiber Technologies fluoroadditives are used for solid elastomer modification.

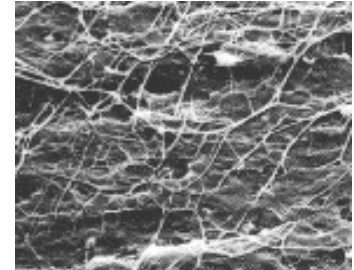


**Neat Elastomer
Unmodified**

Solid elastomers modified with Fiber Technologies are then used as impact modifiers (Fiberprene) for plastics.

Fiber Technologies AP 101 modifies physical performance characteristics of Elastomers:

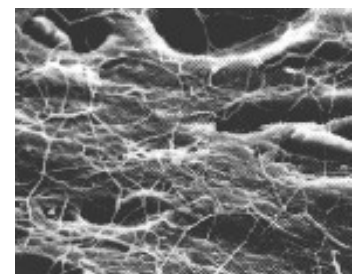
- Tear strength
- Tensile strength
- Modulus
- Abrasion resistance
- Coefficient of friction
- Elastic recovery
- Stiffness
- Durability



**AP 101
Figure 1**

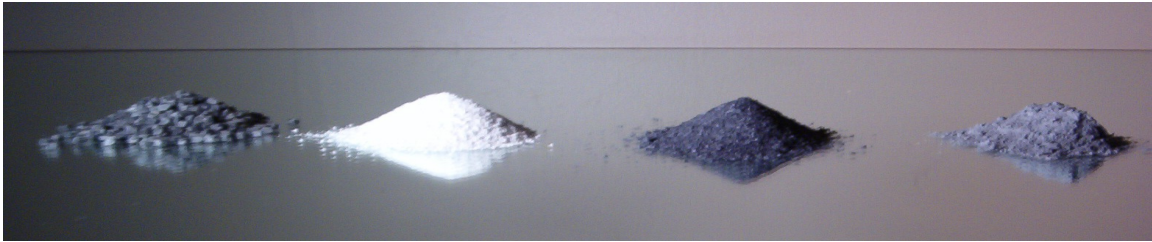
Fiber Technologies AP 101 impart unique features into Elastomers and Plastics:

- Fiber matrix (fig 1,2)
- Internal lubricity
- Improved mold release
- Improved green strength
- Chemical resistance
- Resistance to part deformation
- Improved physical performance (Hot & Cold)



**AP 101 & 202
Figure 2**

Fiber Technologies Fiber Product Benefits



- The base polymer in AP 101 is PTFE. Polytetrafluoroethylene has unique properties.
- PTFE is virtually inert to chemicals and solvents.
- PTFE resists flame ignition and itself does not promote flame spread or significant smoke.
- Dielectric properties of PTFE are excellent and stable over wide ranges of temperature and frequency.
- Fiber Technologies PTFE forms a three-dimensional inter-meshing network of fibers (fig 1,2).
- Fiber Technologies PTFE imparts a mechanical enhancement into Elastomers and Plastics.
- PTFE can affect the behavior of materials without reacting with them or contaminating mix design or work environments.
- PTFE is non-hazardous
- PTFE has a low Coefficient of Friction
- PTFE is insoluble in water
- PTFE does not discolor or degrade in sunlight or high temperatures.
- Fiber Technologies PTFE is compatible with all Elastomers and Plastics
- Fiber Technologies PTFE can help increase production and reduce scrap rates
- Facilitates the use of recycled products
- Helps to impart fire resistant properties

** The PTFE network is formed and completed during compounding. It requires high shear to fracture and disperse the fiber network into usable form. Banbury mixing equipment is preferred for compounding and dispersion.

Product Information

Properties	Fiber Technologies AP 101	Fiber Technologies AP 202
Color	Gray	Gray
Particle Size	2-50 Micron	2-20 Microns
Specific Gravity	≈ 2.4	≈ 2.5
Functions	Reinforcing Fiber Network Improved Modulus Improved Tear Strength	Reduce Coefficient of Friction Improved Mold Release Improved Internal Lubricity
Normal Level of Use	2 - 12 pph	2 - 25 pph+

Products that benefit from AP 101 and FIBERPRENE

Asphalt
 Belts
 Coatings
 Conveyer Lines
 Connectors
 Diaphragms
 Door-Window Seals
 Flexing Components
 Foam
 Gaskets
 Grips
 Grommets
 Hoses
 Insulation
 Isolators
 Bumpers

Supports
 Mats
 Motor Mounts
 O-Rings
 Pads
 Plastics
 Plugs
 Protective covers
 Road Expansion Joints
 Rollers
 Room Temp. Vulcanite's
 Seals
 Spacers
 Stops
 Tires
 Tube Connectors
 Vibration Dampers
 Wiper blades

Examples of Elastomer Modification of Plastic

Example POLYPROPYLENE COPOLYMER HIMONT PRO-FAX 7823

	AVERAGE VALUES Himont PRO-FAX 7823	AVERAGE VALUES with 5% FIBERPRENE®
RESIN		
Melt Flow, @230 C@2.16 Kg	0.4g/10 min	0.6g/ 10 min
Density	0.897	0.900
MECHANICAL		
Tensile Strength, psi	4,000	3,700
Tensile Elongation @ Yield	23%	28%
Ultimate Elongation	---	830%
Flexural Strength	---	4,500 psi
Flexural Modulus, psi	160,000	141,000
Notched Izod Impact, ft lb./in		
@ Room temperature	10	>16 (no breaks)
@-20°C	---	0.1
THERMAL		
Heat Deflection Temperature F@66psi/455 Kpa	172°F	178°F

These average values were obtained from specimens molded and tested under carefully controlled laboratory conditions. This data should be used only as a guide and no assurance can be granted by Fiber Technologies that all molded articles will exhibit duplicate properties as those listed above.

POLYPROPYLENE COPOLYMER

PP 063 BK RECYCLE POLYPROPYLENE

TYPICAL PROPERTIES OF INJECTION MOLDED SPECIMENS

	CONTROL VALUES PP 063 BK	ASTM Test Method	PP063 BK & 5% FIBERPRENE®
RESIN			
Melt Flow, g/10 min	8.0	D-1238	8.47
Density, g/ cc	0.905	D-1505	0.907
MECHANICAL:			
Tensile Strength, psi	2,500	D-638	3,500
Falling Dart Impact, in/lbs	300	D-3029	480
Flexural Modulus, psi	160,000	D-790	120,000
Notched Izod Impact, ft lb/in	2.0		6.53
Hardness, Rockwell R	80		Unavailable
THERMAL			
Heat Deflection Temperature			
F @ 66 psi/ 455 Kpa	85	D-648	94
C@ 264 psi/ 1820 Kpa	57	D-648	63

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**FIBERPRENE® EVALUATION
IN
POLYPROPYLENE**

PHYSICAL PROPERTIES	ASTM	UNITS	TVK-781 pp Control Natural	TVK-781 pp 7% FIBERPRENE®	TVK-781 pp 7% Finaprene®
Flexural Modulus	D790	psi	83,000	77,000	77,000
Flexural Strength	D790	psi	6,400	5,700	5,700
Notched Izod	D256	ft lbs/in	0.09	3.50	.32

**FIBERPRENE® EVALUATION
IN HIPS**

PHYSICAL PROPERTIES	ASTM	UNITS	945E HIPS Control Natural	945E HIPS 7% FIBERPRENE®
Flexural Modulus	D790	psi	166,000	167,000
Flexural Strength	D790	psi	6,400	6,000
Notched Izod	D256	ft lbs/in	2.7	4.3

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**LINEAR LOW DENSITY POLYETHYLENE
LLDP & 20 % CRUMB RUBBER & 5% FIBERPRENE®
RECYCLE LINEAR LOW DENSITY POLYETHYLENE
DATA SHEET**

	CONTROL VALUES	ASTM Test Method	LLDP & 20% Crumb Rubber FIBERPRENE® 5%
RESIN			
Melt Flow, g/10 min	2.6	D-1238	2.9
Density, g/ cc	0.936	D-1505	0.951
MECHANICAL			
Tensile Yield	MD 1,300	D-882	1,700
	TD 1,000	D-882	1,400
Falling Dart Impact - in lbs	300	D-3029	480
Tensile @ Break	MD 5,100	D-882	5,400
	TD 2,500	D-882	2,900
Elongation @ Break	MD 130	D-882	170
	TD 610	D-882	650
Flexural Modulus, psi	56,000	D-790	142,000
Notched Izod Impact, ft lb/in	0.8		4.7

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FIBERPRENE[®] MODIFIED HOMOPOLYMER POLYPROPYLENE

PROPERTY	Method	Unit	Poly-propylene	Blend 1	Blend 2	Blend 3	Blend 4
Tensile Strength	D638	psi	4,708	4,665	4,352	4,153	3,834
		MPa	32	32	20	29	26
Tensile Elongation	D638	%	23	23.1	22.2	22.2	22.4
Flexural Strength, psi	D790	psi	6,537	6,462	6,377	5,850	5,857
		MPa	45	45	44	40	40
Flexural Modulus, psi	D790	psi	157,000	169,700	174,500	147,300	148,200
		MPa	1,083	1,170	1,203	1,016	1,022
Izod Impact Strength	D256	ft lbs/in	0.78	1.43	1.55	2.03	2.27
		J/M	41.73	76.505	89.925	108.605	121.445
Formulation:		Lot/wt%					
Homopolymer Polypropylene			100	95	90	85	80
FIBERPRENE [®]				5	10	15	20

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FIBERPRENE[®] MODIFIED HIGH IMPACT POLYSTYRENE

PROPERTY	Method	Unit	HIPS	Blend 1	Blend 2	Blend 3	Blend 4
Tensile Strength	D638	psi	4,214	3,739	3,605	3,063	3,100
		MPa	29	26	25	21	21
Tensile Elongation	D638	%	9	7.8	6.8	3.4	6.7
Flexural Strength, psi	D790	psi	6,608	5,509	5,487	5,229	4,600
		MPa	46	38	38	36	32
Flexural Modulus, psi	D790	psi	330,500	283,300	282,300	262,600	232,300
		MPa	2,279	1,954	1,947	1,811	1,602
Izod Impact Strength	D256	ft lbs/in	2.78	4.07	4.91	6.67	8.73
		J/M	148.7	217.7	262.7	356.8	467.1
Formulation		-wt/wt%					
Fina 825			100	95	90	85	80
FIBERPRENE [®]				5	10	15	20

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