Fluorosint® PTFE Family of Advanced Fluoropolymer Materials

QUADRANT

You inspire … we materialize®

FLUOROSINT ENHANCED PTFE MATERIALS

See How These Materials Stack Up In Your Application

Quadrant developed the Fluorosint range of enhanced PTFE materials to fill the performance gaps where unfilled and low-tech, filled PTFE based polymers underperform. Each Fluorosint material was specifically developed to excel in demanding bearing and seal applications. While each of these materials possess the chemical resistance and compliance of PTFE, each material offers some special benefits that give the designer clear performance advantages.

Higher pressure seals and wear parts where precision is critical.

Fluorosint® 500
- Outstanding dimensional stability - approximating aluminum
- Low deformation under load

Lower pressure seats and seals where virgin PTFE fails and FDA compliance may be required.

Fluorosint® 207
- FDA compliant
- Very good wear resistance
- Very low coefficient of friction

High performance bearings, bushings and seals where higher loads and minimal wear are required.

Fluorosint® HPV
- FDA compliant
- Excellent wear resistance
- Unmatched bearing performance

Extreme service seals and wear parts at elevated temperature where strength and stability are critical.

Fluorosint® MT-01
- Excellent resistance to deformation
- Good wear resistance
- Very dimensionally stable

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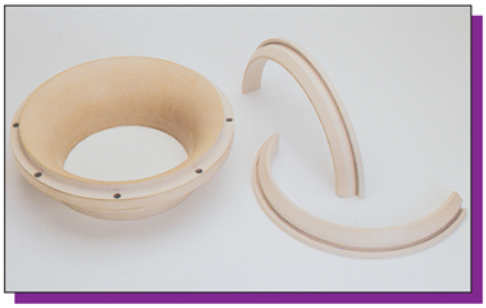
FLUOROSINT® 500

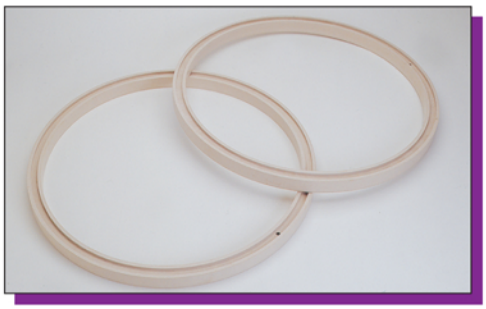
Exceptional Dimensional Stability for Precise Tolerance Control

Key Benefits

Fluorosint 500 Enhanced PTFE offers an ideal combination of stability and wear-resistance for sealing applications where tight dimensional control is required. Fluorosint 500 also greatly reduces the risk of a catastrophic system failure by becoming a sacrificial wear surface. With a deformation under load 9 times lower than virgin PTFE, Fluorosint 500 allows designers to greatly improve the efficiency of systems without sacrificing the wear resistance and forgiving benefits of PTFE. The synthetic mica developed and manufactured by Quadrant delivers tolerance performance approximating that of aluminum.

Light Tan / Grey





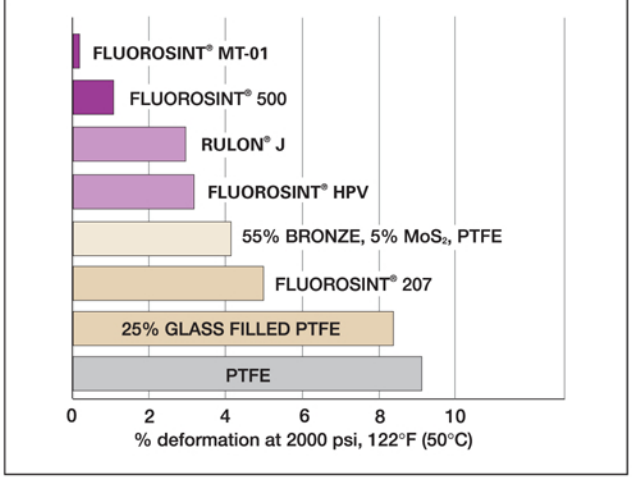
Common Applications

- Split and one-piece seals
- Valve seats
- Shrouds
- Slide bearings
- Wear strips
- Sacrificial, abradable seals
- Thrust washers

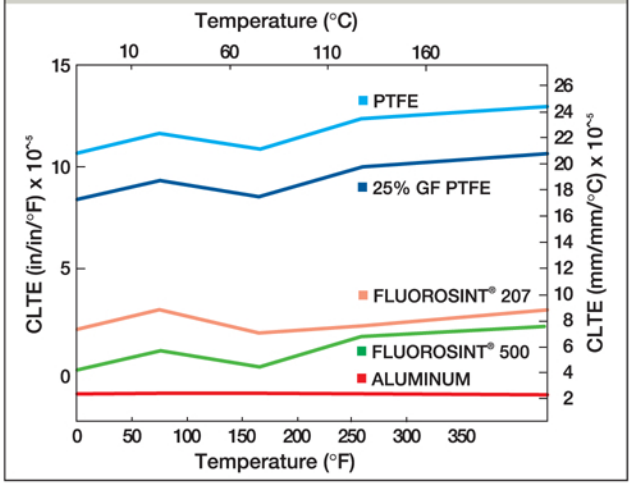
APPLICATION EXAMPLE

Fluorosint 500 has been used very successfully as a replacement for metal/aluminum seals and shrouds in compressors. In addition to the security a sacrificial part provides the system, Fluorosint 500 allows the introduction of abradable sealing technology where mating parts are allowed to "cut" their own running clearance and thus permitting significant gains in efficiency.

Deformation Under Load



Coefficient of Linear Thermal Expansion



FLUOROSINT® 207

Lowest Coefficient of Friction of Fluorosint® Grades

Key Benefits

FDA compliant Fluorosint 207 Enhanced PTFE is a significant performance upgrade for any designer using PTFE for applications where temperature resistance, chemical resistance and FDA compliance are all important. Fluorosint 207 lasts far longer than unfilled PTFE in wear applications and has an extremely low coefficient of friction. Fluorosint 207 works well against most mating surfaces.

White / Light Grey

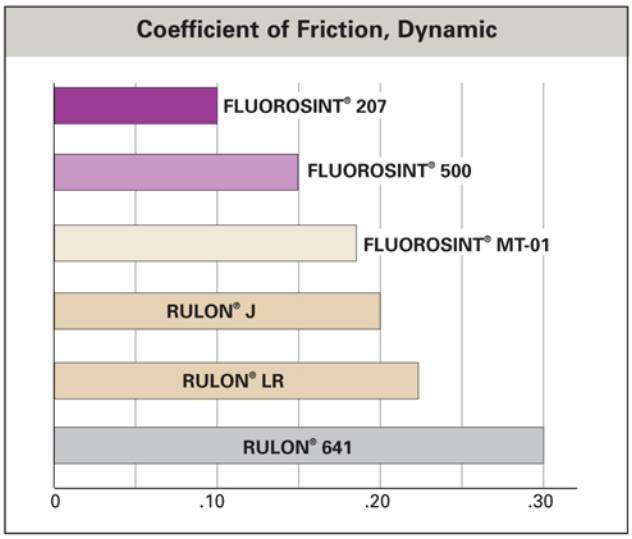
FDA Compliant

Common Applications

- Seals
- Mixers
- Pumps
- Appliances
- Bearings
- Valve seats

APPLICATION EXAMPLE

Fluorosint 207 replaces unfilled PTFE and low-tech, filled PTFE's in wear and seal applications where either stability or wear resistance are causing failures. A commercial beverage filling system replaced virgin PTFE seals with Fluorosint 207 and improved fill accuracy associated with leaks caused by failed seals.



FLUOROSINT® HPV

Most Wear Resistant Fluorosint Grade - Outlasts Low-tech PTFE Based Materials

Key Benefits

FDA compliant Fluorosint HPV is a high performance bearing grade of Fluorosint - optimized for high PV and very low "K", or wear factor. Fluorosint HPV was developed for bearing applications where other, low-tech PTFE formulations exhibit premature wear or simply cannot perform. FDA compliance gives food and pharmaceutical equipment manufacturers new design options and all benefit from its excellent load bearing and wear characteristics.

Light Tan / Grey

FDA Compliant

Common Applications

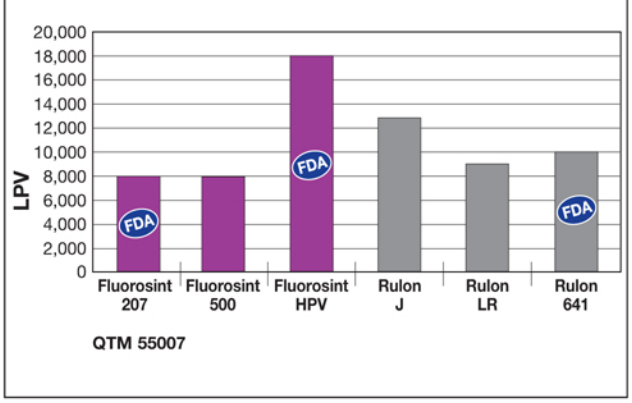
- Bearings
- Commercial food equipment
- Wear guides
- High performance seals
- Thrust washers

APPLICATION EXAMPLE

Fluorosint HPV was specified by a manufacturer of commercial sausage production equipment as a replacement for a low-tech filled PTFE material. The old material would wear quickly and not properly stretch the product during filling. The premature wear caused tears in the product and required frequent replacement. An additional benefit of Fluorosint HPV – improved dimensional stability – allowed designers to remove a press fit metal part that was required to compensate for the low-tech material's lack of dimensional control.

Limiting PV (Higher is Better)

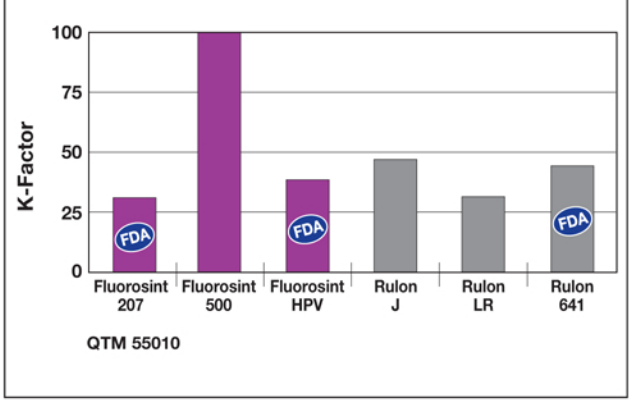
(4:1 Safety Factor Applied)



QTM 55007

Relative Wear Resistance (Lower is Better)

("k" factor)



QTM 55010

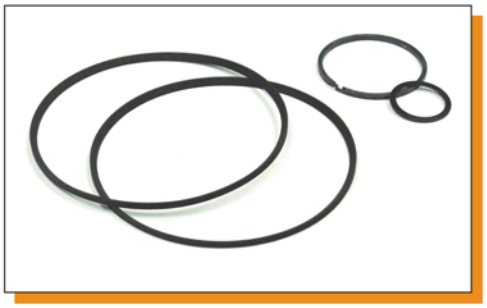
FLUOROSINT® MT-01

Ultra-High Performance Grade For Stability At Elevated Temperature

Key Benefits

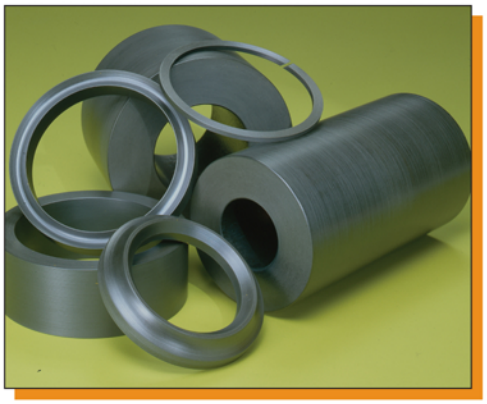
Fluorosint MT-01 is an extreme service grade developed specifically for applications where the benefits of PTFE-based materials also require strength, stiffness and stability. Fluorosint MT-01 delivers high mechanical performance at elevated temperature and as a result is often specified in seat, seal and wear applications where extreme conditions are present.

Dark Grey



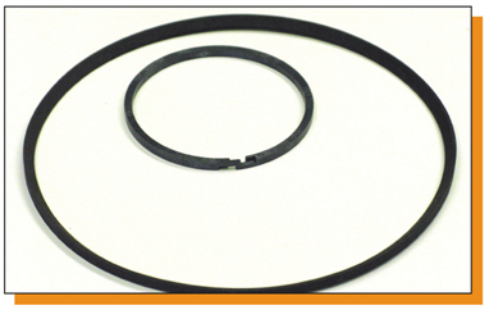
Common Applications

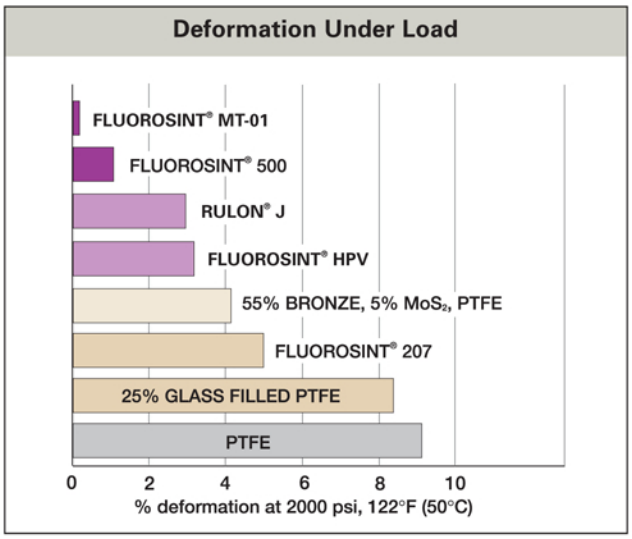
- High temperature seals
- Linear guides
- Wear bands
- Ovens and dryers

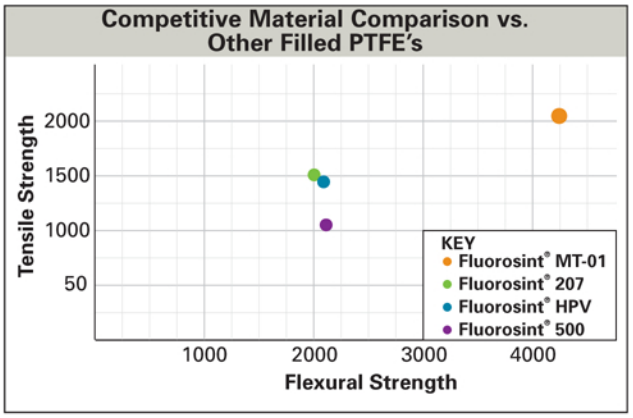


APPLICATION EXAMPLE

Fluorosint MT-01 is widely specified in chemical processing equipment like the aggressive environment present during sour gas processing. Fluorosint MT-01 extends the temperature envelope of PTFE and provides remarkable stability for applications that see extremes. Seals, replaced monthly in oil recovery equipment have been replaced with Fluorosint MT-01 and now outlast other components.







PHYSICAL PROPERTY DATA

		Properties	Test Method	Fluorosint 500 Mica Filled PTFE	Fluorosint 207 Mica Filled PTFE	Fluorosint HPV Mica Filled PTFE	Fluorosint MT-01 Enhanced PTFE
MECHANICAL	1	Specific Gravity, 73°F.	D792	2.32	2.3	2.06	2.27
	2	Tensile Strength, 73°F.	D638	1,100	1,500	1,450	2,100
	3	Tensile Modulus of Elasticity, 73°F.	D638	300,000	250,000	210,000	326,000
	4	Tensile Elongation (at break), 73°F.	D638	30	50	90	40
	5	Flexural Strength, 73°F.	D790	2,200	2,000	2,500	4,000
	6	Flexural Modulus of Elasticity, 73°F.	D790	500,000	350,000	165,000	488,000
	7	Shear Strength, 73°F.	D732	2,100	1,700	2,500	2,600
	8	Compressive Strength, 10% Deformation, 73°F.	D695	4,000	3,800	3,000	3,400
	9	Compressive Modulus of Elasticity, 73°F.	D695	250,000	225,000	110,000	250,000
	10	Deformation Under Load, % def @ 2,000 PSI, 122°F (50°C)	-	5.0%	1.1%	3.2%	0.2%
	11	Hardness, Rockwell, Scale as noted, 73°F.	D785	R55	R50	R44	R74
	12	Hardness, Durometer, Shore "D" Scale, 73°F.	D2240	D70	D65	D64	D75
	13	Izod Impact (notched), 73°F., ft. lb./in. of notch	D256 Type "A"	0.9	1	1.8	0.8
	14	Coefficient of Friction (Dry vs. Steel) Dynamic	QTM55007	0.15	0.1	0.15	0.18
	15	Limiting PV (with 4:1 safety factor applied)	QTM55007	8,000	8,000	20,000	4,500
	16	Wear Factor "k" x 10^{-10}	QTM55010	600	30	38	200
THERMAL	17	Coefficient of Linear Thermal Expansion (-40°F to 300°F)	E-831 (TMA)	2.5×10^{-5}	5.7×10^{-5}	4.9×10^{-5}	3.0×10^{-5}
	18	Heat Deflection Temperature 264 psi	D648	270	210	180	200
	19	Tg-Glass transition (amorphous)	D3418	N/A	N/A	N/A	N/A
	20	Melting Point (crystalline) peak	D3418	621	621	621	-
	21	Continuous Service Temperature in Air (Max.) (1)	-	500	500	500	600
	22	Thermal Conductivity	F433	5.3	-	-	-
ELECTRICAL	23	Dielectric Strength, Short Term	D149	275	200	-	-
	24	Surface Resistivity	EOS/ESD S 11.11	$>10^{13}$	$>10^{12}$	$>10^{13}$	$<10^{5}$
	25	Dielectric Constant, 10^{6} Hz	D150	2.85	2.65	-	-
	26	Dissipation Factor, 10^{6} Hz	D150	0.008	0.008	-	-
	27	Flammability @ 3.1 mm (1/8 in.) **(5)**	UL94	V-0	V-0	V-0	V-0
CHEMICAL (3)	28	Water Absorption Immersion, 24 Hours	D570 (2)	0.1	0.03	0.15	0.1
	29	Water Absorption Immersion, Saturation	D570 (2)	3	0.2	0.43	-
	30	Acids, Weak, acetic, dilute hydrochloric or sulfuric acid	-	A	A	A	A
	31	Acids, Strong, conc. hydrochloric or sulfuric acid	-	A	A	A	A
	32	Alkalies, Weak, dilute ammonia or sodium hydroxide	-	A	A	A	A
	33	Alkalies, Strong, strong ammonia or sodium hydroxide	-	U	U	U	A
	34	Hydrocarbons-Aromatic, benzene, toluene	-	A	A	A	A
	35	Hydrocarbons-Aliphatic, gasoline, hexane, grease	-	A	A	A	A
	36	Ketones, Esters, acetone, methyl ethyl ketone	-	A	A	A	A
	37	Ethers, diethyl ether, tetrahydrofuran	-	A	A	A	A
	38	Chlorinated Solvents, methylene chloride, chloroform	-	A	A	A	A
	39	Alcohols, methanol, ethanol, anti-freeze	-	A	A	A	A
	40	Continuous Sunlight	-	A	A	A	A
OTHER	41	FDA Compliance	-	N	Y	Y	N
	42	Relative Cost (4)	-	$$	$$$	$$$	$$$$
	43	Relative Machinability (1-10, 1=Easier to Machine)	-	2	2	2	5

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