



A Product of DuPont Dow Elastomers

## Fluid Resistance Guide

The range of chemicals to which Viton fluoroelastomer is resistant is one of the broadest in the industry. DuPont Dow Elastomers has introduced several Viton products that will give the compounder a greater flexibility in formulating parts requiring chemical resistance.

### Notes

This bulletin is a starting point for the evaluation of the suitability of Viton in a particular application. The data here are based on laboratory work done under controlled conditions. Wherever possible, compounds should be tested under actual or closely simulated field conditions.

It should be noted that commercial and proprietary fluids may contain additives to improve handling or end-use conditions. These additives may vary with manufacturing locations although the fluids carry identical product labels. It is these additives that may have an adverse effect on the Viton rather than the major constituent of the fluid.

### General Chemical Resistance

Viton is resistant to oils, aqueous media and most other fluids. The range of chemicals to which Viton is resistant is so broad that it is by far easier to list the few chemicals in which Viton will be chemically attacked or swollen.

In general, low molecular weight ketones and esters will swell a vulcanizate of Viton and, in fact, ketones such as methyl ethyl ketones are used as solvents for uncured Viton. Esters such as ethyl acetate are also used as solvents for Viton (uncured). The more polar a material the more likely it will swell Viton. Much work is being done in the area of solubility parameters to characterize the swelling behavior of various fluids by comparison of dispersion, hydrogen bonding and dipole parameters to the corresponding parameters of the elastomer.

Amines affect Viton differently from the ketones and esters. Generally, amines will react with the polymer backbone and result in embrittlement of the vulcanizate. The elongation will drop off significantly and hardness will increase. Amines are just one kind of base. In general, strong bases such as sodium hydroxide at relatively high concentrations will degrade Viton. In summary, a basic understanding of chemistry is helpful in judging an elastomer's resistance to swelling or degradation.

### Compounding

A typical recipe for Viton will contain, besides the polymer, curatives (diamines, polyols, or peroxides), metal oxides (calcium oxide, magnesium oxide in combination with calcium hydroxide, oxides of lead), reinforcing fillers (carbon blacks, diatomaceous earth, and other mineral fillers) and processing aids as necessary. The use of these different compounding materials in formulating compounds based on Viton can have a significant effect on the performance of the vulcanizate in service.

The volume of elastomer in the compound, much more than the degree of crosslinking, can have a marked effect on volume swell after fluid immersion. Compounds with substantially more or less Viton will agree only qualitatively with the values printed in the tables.

In general, the oxides of lead, and in particular litharge, are used when resistance to aqueous media is of primary importance. Peroxide-cured compounds of Viton are usually more resistant to aqueous media than compounds cured with either diamines or polyols. Bear in mind that a standard formulation of Viton, such as one using a polyol, magnesium oxide/calcium hydroxide cure system, still has excellent resistance to most fluids. Compounding bulletins on the various types of Viton and curing systems are available and provide more detailed information on formulations.

## Families of Viton

Polymers of Viton can be classified into three basic types: “A-type,” “B-type” and “F-type.” This corresponds to the fluorine content of the polymers. An increased fluorine level means better fluid resistance.

Comparable fluorine levels mean that polymers within the same types have similar heat and fluid resistance and similar low-temperature properties. Polymers differ within types by molecular weight distribution and viscosity. This leads to varying degrees of processibility.

“A-type” Viton—66% fluorine: Dipolymers of Hexafluoropropylene (HFP) and Vinylidene Fluoride (VF2).

“B-type” Viton—68% fluorine: Terpolymers of HFP, VF2 and Tetrafluoroethylene (TFE).

“F-type” Viton—70% fluorine: Terpolymer with higher fluorine level of HFP, VF2 and TFE.

There is also a “Specialty-type” classification for Viton polymers. These polymers have special properties; improved low-temperature flexibility and very broad chemical resistance.

Viton GLT—Peroxide curable polymer with optimum low-temperature flexibility. Has “A-type” fluid resistance.

Viton GFLT—Peroxide curable polymer with excellent low-temperature flexibility. Has “F-type” fluid resistance.

Viton VT-R-6186, Viton VT-R-6279—fluoroelastomers that exhibit the broadest chemical resistance of any Viton. These polymers have outstanding resistance to strong bases and amines and good resistance to polar solvents.

## Handling Precautions

When recommended handling procedures are followed, Viton fluoroelastomers and products based on them, in themselves, present no health hazards of which DuPont Dow Elastomers is aware. However, certain hazards may arise during the compounding and processing of the raw polymers into finished products or during service at temperatures substantially above 200°C (392°F). For example, toxic vapors, which may include hydrogen fluoride,<sup>1</sup> may be liberated from products based on Viton during cure, post-cure or service at temperatures above 200°C (392°F). Adequate ventilation should be provided in work areas where compounds or parts of Viton are being processed or are likely to be exposed to temperatures in this range. Avoid breathing vapors or dusts from such operations. Anyone who inhales such vapors or dusts should be taken at once to fresh air. By following these precautions, there should be no problem in staying within the limits set by OSHA. Before handling or processing Viton, be sure to read and be guided by suggestions in DuPont Dow Elastomers technical bulletin H-71129-02 “Handling Precautions for Viton® and Related Chemicals.”

Compounding ingredients and solvents that are used with Viton to prepare finished products or evaluate fluid resistance may present hazards in handling and use. Before proceeding with any compounding, processing or testing work, consult and follow label directions and handling precautions from suppliers of all ingredients.

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<sup>1</sup>Hydrogen fluoride is regulated as an air contaminant in the United States under the Occupational Safety and Health Act (refer to CFR Title 29 1910.1000). This sets the 8-hr time weighted average exposure limit in any 8-hr work shift of a 40-hr work week at 3 ppm.

### Fluid Resistance of Viton® Fluoroelastomer

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change	
					Tensile Strength	Elongation at Break			
Acetamide		100 (212)	7 days	A	89	100	4	6	
		150 (302)	3 days	A	11	8	3	11	
		150 (302)	7 days	A	Brittle Samples disintegrated		9	9	
		205 (401)	3 days	A					
Acetic Acid	Glacial	20 (68)	7 days	A	26	59	-22	86	
		20 (68)	30 days	A			-20	104	
		20 (68)	30 days	B			-35	92	
		90 (194)	70 hrs	—	VT-R-6186	62	118	-17	18
		90 (194)	70 hrs	—	VT-R-6279	57	113	-16	16
		118 (244)	3 days	A					110
		118 (244)	3 days	F	GF				26
Acetic Anhydride		20 (68)	7 days	B				140	
		45 (113)	7 days	—	VT-R-6186	62	118	-17	18
		45 (113)	7 days	—	VT-R-6279	57	113	-16	16
		70 (158)	7 days	B				140	
Acetone		20 (68)	2 days					341	
		20 (68)	7 days	A				181	
		20 (68)	7 days	A	38	87	-19	181	
		20 (68)	7 days	—	VT-R-6186				25
		20 (68)	56 days					305	
Acetone/Toluene	50%/50%	20 (68)	2 days					187	
		60 (140)	3 days	A				120	
Acetylene Tetrabromide		20 (68)	28 days	A			1	1	
Acid Mixture H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HNOSO <sub>4</sub> H <sub>2</sub> O	51% 28% 4% 17%	38 (100)	17 days	B				8	
Acrylonitrile		20 (68)	8 days	B				88	
		50 (122)	7 days	A				120	
ADIPRENE L-167		100 (212)	4 days	B	65	58	-5	6	
AEROSAFE 2300		150 (302)	7 days	A	2	12	-59	389	
		150 (302)	7 days	B	7	24	-59	297	
AEROSAFE 2300W		150 (302)	7 days	A	2	12	-59	362	
		150 (302)	7 days	B	4	18	-60	314	
Aeroshell 100		70 (158)	14 days	A				2	
Aeroshell Fluid No. 4		150 (302)	40 days	A	75	108	-2	3	
Aeroshell Turbine Oil 760		70 (158)	14 days	A				2	
Ammonium Hydroxide		23 (73)	7 days	B	B401	82	131	-2	6
		23 (73)	2 wks	B	B401	62	151	-7	14
Ammonium Hydroxide (Saturated)		20 (68)	28 days	A				8	

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change	
					Tensile Strength	Elongation at Break			
Ammonium Sulfate		23 (73)	7 days	B	B401	98	103	-3	1
Ammonium Sulfide		23 (73)	7 days	B	B401	70	74	-2	4
Amyl Acetate		20 (68)	2 days	B					308
		20 (69)	7 days						280
		20 (68)	56 days						319
		70 (158)	2 days						287
Amyl Alcohol (1-Pentanol)		20 (68)	56 days	B					0.7
		70 (158)	2 days						3
		70 (158)	56 days						5
		100 (212)	5 days						9
Anderol 774		200 (392)	70 hrs	A	E60C	86	0	-6	11
		200 (392)	70 hrs	F	GF	94	108	-4	5
		200 (392)	70 hrs	B	GBL 900	91	103	-5	8
Anderol L-774		38 (100)	6 mos	A		100	105	2	0.7
		38 (100)	2 yrs	A		85	93	-6	1
		38 (100)	3 yrs	A		73	86	-7	8
		150 (302)	3 days	A		75	95	-10	13
		150 (302)	3 days	B		82	146	-8	9
		175 (347)	4 days	A				-10	12
		175 (347)	4 days	B				-9	9
		205 (401)	3 days	A		81	96	-7	10
		205 (401)	3 days	B		81	125	-1	10
		205 (401)	4 days	B				-7	12
		205 (401)	7 days	A		68	99	-5	16
		205 (401)	7 days	B		71	98	-3	9
		205 (401)	21 days	B		59	68	-4	13
	205 (401)	21 days	A		47	61	-5	18	
	205 (401)	28 days	A		41	60	-14	20	
Anderol L-826		150 (302)	28 days	A				-8	11
Anderol L-829		150 (302)	28 days	A				-4	5
Aniline		20 (68)	2 days	A		100	100		0.5
		20 (68)	7 days						3
		20 (68)	56 days						4
		70 (158)	2 days						11
		70 (158)	28 days						26
		70 (158)	56 days						55
ASTM Hydrocarbon Test Fluid		150 (302)	7 days	A		82	110	3	6
		175 (347)	7 days	A		83	115	0	8
ASTM Oil No. 1		150 (302)	3 days	A		103	100	1	0.2
		150 (302)	7 days	A				-5	0.6
		150 (302)	500 hrs	A	A-200	132	93	-1	0
ASTM Oil No. 3		100 (212)	14 days	A		86	95	-3	1
		100 (212)	14 days	B		90	94	-1	1
		150 (302)	3 days	A		110	95	5	3
		150 (302)	3 days	B		98	100	9	3
		150 (302)	7 days	A		95	100	-1	4

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change
					Tensile Strength	Elongation at Break		
ASTM Oil No. 3 (continued)	150 (302)	350 hrs	A		111	95	-1	4
	150 (302)	350 hrs	B		107	95	2	4
	150 (302)	14 days	B		87	122	-3	3
	150 (302)	70 hrs	A	E60C	98	106	0	2
	150 (302)	70 hrs	F	GF	103	0	-2	2
	150 (302)	70 hrs	B	GBL 900	96	97	-1	2
	150 (302)	500 hrs	A	A-200	114	87	-1	4
	150 (302)	1000 hrs	A		106	95	1	5
	150 (302)	1000 hrs	B		85	58	3	6
	150 (302)	2000 hrs	A		120	71	7	9
	150 (302)	2000 hrs	B		85	40	16	10
	150 (302)	3000 hrs	A		107	71	7	11
	150 (302)	3000 hrs	B		75	26	14	12
	175 (347)	7 days	A		82	90	0	2
	ASTM Reference Fuel A	20 (68)	7 days	B		100	108	-2
20 (68)		7 days	A		91	90	0	0
ASTM Reference Fuel B	20 (68)	7 days	A		96	99	1	1
	20 (68)	7 days	B		90	100	1	1
	25 (77)	70 hrs	A	E60C	0	107	-1	1
	25 (77)	70 hrs	A	A-401C	94	96	0	1
	25 (77)	70 hrs	B	B600	99	108	2	1
	25 (77)	70 hrs	F	F-601C	109	111	1	1
	25 (77)	70 hrs	—	GLT	76	86	-2	3
	25 (77)	70 hrs	—	GFLT	80	85	-3	2
	40 (104)	3 days	A		74	86	-4	2
	70 (158)	3 days	B		81	118	-6	12
70 (158)	3 days	A		79	94	-9	12	
ASTM Reference Fuel C	20 (68)	1 day	A					1
	20 (68)	1 day	B					2
	20 (69)	3 days	B		89	136	-4	3
	20 (68)	3 days	GF		76	111	-2	2
	20 (68)	7 days	A		77	90	-4	6
	20 (68)	7 days	B		69	170	-14	6
	20 (68)	7 days	GF		62	86	-3	3
	20 (68)	3 wks	A		70	78	-5	10
	20 (68)	3 wks	B		78	76	-6	9
	20 (68)	30 days	A					10
	20 (68)	30 days	B					10
	20 (68)	6 wks	A		60	62	-5	12
	20 (68)	6 wks	B		64	66	-7	8
	20 (68)	6 mos	A					15
	20 (68)	6 mos	B					13
	23 (73)	70 hrs	—	GLT				7
	23 (73)	70 hrs	—	GFLT				3
	23 (73)	7 days	A	E60C	87	82	-4	4
	23 (73)	7 days	B	B401	96	93	-11	6
	23 (73)	7 days	B	B600	88	90	-3	3
	23 (73)	7 days	F	F-601C	88	96	-3	2
	23 (73)	7 days	F	GF	89	92	-2	3
	23 (73)	7 days	—	GLT	75	85	-6	7
	23 (73)	7 days	—	GFLT	87	94	-4	4
	23 (73)	7 days	—	VT-R-6279	81	96	-4	5

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change	
					Tensile Strength	Elongation at Break			
ASTM Reference Fuel C (continued)		70 (158)	70 hrs	A	E60C	67	82	-9	6
		70 (158)	70 hrs	B	B401	81	98	-10	4
		70 (158)	166 hrs	A	E60C	68	77	-8	6
		70 (158)	166 hrs	B	B401	80	92	-11	4
		70 (158)	2 wks	A	E60C	68	82	-9	6
		70 (158)	2 wks	B	B401	83	0	-10	4
		70 (158)	1 day	A					16
		70 (158)	1 day	B					16
		70 (158)	3 days	A		79	93	-16	17
		70 (158)	7 days	A		56	67	-12	18
		70 (158)	7 days	B		64	67	-13	15
		70 (158)	3 wks	A		65	78	-6	19
		70 (158)	3 wks	B		70	67	-5	17
		70 (158)	30 days	A					20
		70 (158)	30 days	B					18
		70 (158)	6 wks	A		60	83	-15	16
		70 (158)	6 wks	B		63	68	-8	16
		70 (158)	6 mos	A					22
		70 (158)	6 mos	B					19
		70 (158)	5000 hrs	A		72	78	-6	17
	100 (212)	3 days	A		60	70	-11	20	
	100 (212)	3 days	B		72	95	-9	16	
ASTM Reference Fuel C/ETBE (t-Butyl Ethyl Ether)	90%/10%	23 (73)	2 wks	A	E60C	84	94	-6	4
		23 (73)	2 wks	B	B600	80	91	-5	4
		23 (73)	2 wks	F	GF	92	94	-2	2
		23 (73)	2 wks	—	GFLT	77	91	-4	6
	75%/25%	23 (73)	7 days	A	E60C	80	99	-4	4
		23 (73)	7 days	B	B600	74	97	-3	4
		23 (73)	7 days	F	GF	82	84	-2	2
		23 (73)	7 days	—	GFLT	77	91	-4	6
		23 (73)	7 days	—	GLT	75	90	-5	8
		23 (73)	7 days	—	VT-R-6279	74	104	-5	5
	50%/50%	23 (73)	7 days	A	E60C	94	107	-4	5
		23 (73)	7 days	B	B600	74	94	-2	5
		23 (73)	7 days	F	GF	86	97	-3	3
		23 (73)	7 days	—	GFLT	75	93	-5	7
		23 (73)	7 days	—	GLT	74	87	-6	9
		23 (73)	7 days	—	VT-R-6279	77	110	-6	5
	25%/75%	23 (73)	7 days	A	E60C	90	107	-4	5
		23 (73)	7 days	B	B600	75	98	-3	5
		23 (73)	7 days	F	GF	84	91	-4	2
		23 (73)	7 days	—	GFLT	78	91	-5	7
23 (73)		7 days	—	GLT	81	93	-6	9	
23 (73)		7 days	—	VT-R-6279	76	111	-4	5	
ASTM Reference Fuel C/Ethanol	85%/15%	20 (68)	7 days	B		69	91	-8	7
		20 (68)	7 days	F	GF	67	86	-6	4
		100 (212)	7 days	B		58	82	-13	24
		100 (212)	7 days	F	GF	54	81	-8	18
	90%/10%	23 (73)	7 days	A	E60C	65	86	-9	13
		23 (73)	7 days	A	B70	69	94	-9	13
		23 (73)	7 days	F	F-601C	89	110	-8	7
		23 (73)	7 days	—	GLT	53	77	-14	17
		23 (73)	7 days	—	GFLT	76	93	-9	9
		24 (75)	2 wks	A	E60C				19
24 (75)	2 wks	B	B600				14		

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change		
					Tensile Strength	Elongation at Break				
		24 (75)	2 wks	—	GLT			22		
		24 (75)	2 wks	—	GFLT			13		
ASTM Reference Fuel C/Methanol	85%/15%	20 (68)	7 days	B		51	100	-7	20	
		20 (68)	7 days	F	GF	52	90	-3	9	
		23 (73)	7 days	A	E60C	52	71	-15	30	
		23 (73)	7 days	B	B401	69	93	-21	12	
		23 (73)	7 days	B	B600	65	99	-11	15	
		23 (73)	7 days	F	F-601C	59	88	-11	7	
		23 (73)	7 days	—	GLT	38	55	-16	32	
		23 (73)	7 days	—	GFLT	63	84	-10	14	
		68 (154)	7 days	B		40	86	-16	29	
		68 (154)	7 days	F	GF	40	86	-11	19	
	70%/30%	23 (73)	7 days	A	E60C	50	68	-17	42	
		23 (73)	7 days	B	B600	64	99	-12	18	
		23 (73)	7 days	F	F-601C	69	102	-9	8	
		23 (73)	7 days	—	GLT	37	52	-18	49	
		23 (73)	7 days	—	GFLT	58	78	-10	16	
		23 (73)	7 days	A	E60C	47	68	-20	57	
	50%/50%	23 (73)	7 days	B	B600	62	96	-13	20	
		23 (73)	7 days	F	F-601C	71	109	-10	8	
		23 (73)	7 days	—	GLT	35	48	-23	75	
		23 (73)	7 days	—	GFLT	60	80	-13	16	
15%/85%		23 (73)	7 days	A	E60C	42	53	-14	85	
		23 (73)	7 days	B	B600	65	99	-14	22	
	23 (73)	7 days	F	F-601C	75	106	-7	4		
	23 (73)	7 days	—	GLT	16	27	-26	120		
		23 (73)	7 days	—	GFLT	76	90	-9	13	
ASTM Reference Fuel C/MTBE (t-Butyl Methyl Ether)	75%/25%	23 (73)	7 days	A	E60C	61	75	-5	22	
		23 (73)	7 days	B	B600	68	85	-5	16	
		23 (73)	7 days	F	F-601C	75	98	-4	10	
		23 (73)	7 days	F	GF	76	94	-3	8	
		23 (73)	7 days	—	GLT	61	71	-6	26	
		23 (73)	7 days	—	GFLT	61	75	-6	17	
		23 (73)	7 days	—	VT-R-6279	72	91	-4	9	
		50%/50%	23 (73)	7 days	A	E60C	49	65	-13	37
			23 (73)	7 days	B	B600	58	80	-13	29
			23 (73)	7 days	F	F-601C	50	80	-13	25
	23 (73)		7 days	F	GF	62	87	-8	21	
	23 (73)		7 days	—	GLT	48	58	-12	43	
	23 (73)		7 days	—	GFLT	42	60	-10	17	
	25%/75%	23 (73)	7 days	—	VT-R-6279	60	83	-5	4	
		23 (73)	7 days	A	E60C	32	38	-18	84	
		23 (73)	7 days	B	B600	39	52	-18	65	
		23 (73)	7 days	F	F-601C	34	57	-25	47	
		23 (73)	7 days	F	GF	41	65	-7	38	
		23 (73)	7 days	—	GLT	18	27	-14	105	
			23 (73)	7 days	—	GFLT	27	41	-15	53
		23 (73)	7 days	—	VT-R-6279	54	79	-15	19	
ASTM Reference Fuel C/Mopar Fuel Injector Cleaner	50%/50%	70 (158)	70 hrs	A	E60C	55	71	-9	13	
		70 (158)	70 hrs	B	B401	66	81	-10	11	
		70 (158)	166 hrs	A	E60C	52	68	-10	3	
		70 (158)	166 hrs	B	B401	60	81	-9	1	
		70 (158)	2 wks	A	E60C	47	59	-9	4	
		70 (158)	2 wks	B	B401	47	62	-10	1	

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type		% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change
						Tensile Strength	Elongation at Break		
ATREX		20 (68)	1 mos	B		89	141	0	0.8
		20 (68)	1 mos	F	GF	99	144	-2	0.5
Automotive Fuel*									
2B		20 (68)	28 days	A					16
		20 (68)	50 days	A					17
RF 2		20 (68)	28 days	A					5
		20 (68)	50 days	A					9
60		20 (68)	28 days	A					13
		20 (68)	50 days	A					15
60B		20 (68)	28 days	A					30
		20 (68)	50 days	A					30
Avrex 903 Hydraulic Oil (Mil-H-6083)		60 (140)	7 days	A		82	108	1	0.6
Avtag. (Shell Aerofuel)		70 (158)	14 days	A					3
Avtur		70 (158)	14 days						1
Benzaldehyde		20 (68)	3 days	A				-17	67
Benzene		20 (68)	2 days						8
		20 (68)	3 days	A					17
		20 (68)	7 days	A		52	69	-14	22
		20 (68)	7 days	B		79	93	-8	12
		20 (68)	21 days	A		45	69	-16	23
		20 (68)	21 days	B		61	73	-8	15
	70 (158)	28 days	A		51	85	-17	30	
Benzophenone		70 (158)	7 days	B		91	16	-5	10
		100 (212)	7 days	B		98	25	-5	12
Benzyl Alcohol		20 (68)	56 days						1
		70 (68)	56 days						6
		121 (250)	4 days	B					7
Biobor JF (Oil Fungicide)		20 (68)	7 days	A		82	83	-6	13
		20 (68)	7 days	B		95	92	-3	4
		20 (68)	7 days	F	GF	92	95	-2	1
Boscan Asphalt, 85-100		205 (401)	7 days	A				4	4
		205 (401)	7 days	B				-2	4
B.P. Aero Hydraulic Fluid No. 1		150 (302)	40 days	A		75	108	-2	3
Bray Oil 762		70 (158)	7 days	B		84	107	-3	
Brayco Hydraulic Oil 783 (Mil-H-6083)		60 (140)	7 days	A		84	100	3	0.4

* Fuel	% Aromatic Hydrocarbons	% Paraffinic Hydrocarbons	% Ethyl Alcohol
2B	32	48	20
RF2	40	60	—
60	60	40	—
60B	48	32	20



**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change
					Tensile Strength	Elongation at Break		
Bromine		20 (68)	5 days	A	75	100	-1	
		100 (212)	5 days	A	74	130	-2	
Bromochloromethane		20 (68)	7 days	A			-19	99
		27 (81)	7 days	B				10
		50 (122)	7 days	B				21
Bunker Fuel Oil 'C'		150 (302)	40 days	A	87	96	-3	
Butadiene (Monomer)		20 (68)	7 days	B	49	83	-9	15
Butanediol 1,4		150 (302)	28 days	A	82	70		6
Butyl Acetate		20 (68)	3 days	A			-24	230
		20 (68)	8 days	B				200
		125 (257)	3 days	A				300+
		125 (257)	3 days	F	GF			70
		125 (257)	3 days	—	VT-R-6186			31
<i>n</i> -Butyl Acrylate		50 (122)	3 days	A	Too soft to test			190
Butyl Alcohol		121 (250)	4 days					10
Butyl CARBITOL		20 (68)	8 days	B				3
		70 (158)	4 days	B				8
		121 (250)	4 days	B				12
Butyl Mercaptan		20 (68)	7 days	B			2	5
Caprolactam		150 (302)	3 days	B	Swelled and cracked			
Carbon Disulfide		20 (68)	28 days	A	96	110	-6	2
Carbon Tetrachloride		20 (68)	7 days	A	85	83	2	1
		38 (100)	6 mos	A	98	105	-4	
		38 (100)	1 yr	A	92	100	-3	
		38 (100)	2 yr	A	86	90	-12	
		38 (100)	3 yr	A	75	86	-9	
		70 (158)	28 days	A	85	95	-6	12
β-Caryophyllin		70 (158)	7 days	B				3
Catalene "B" ( <i>Iso</i> -propyl nitrate)		20 (68)	7 days	A				320
CELLOSOLVE		20 (68)	10 days	B				53
CELLOSOLVE Acetate		20 (68)	8 days	B				140
CELLULUBE 220		70 (158)	7 days	A			-1	2
		70 (158)	20 days	A				8
550A		20 (68)	7 days	A				2
		70 (158)	7 days	A				10

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change
					Tensile Strength	Elongation at Break		
CELLUTHERM 2505A		205 (401)	7 days	B	81	92	-12	15
Chevron PD-4645 ATF		163 (325)	3 days	B	74	71	1	2
		163 (325)	14 days	B	62	61	2	2
		175 (347)	3 days	B	84	73	0	2
CHLOREXTOL		100 (212)	7 days	B				6
Chlorine	Gas (dry)	100 (212)	5 days	B	81	110	-3	
Chlorine Dioxide	1.3 gm/L	20 (68)	30 days					10
	6.3 gm/L	20 (68)	30 days					15
Chlorine Trifluoride		20 (68)	30 min					0
Chlorobenzene		20 (68)	30 days	A		-4		10
Chlorobutadiene		-20 (-4)	2 days	A		-2		5
Chloroform		20 (68)	7 days	A			-17	11
Chlorosulfonic Acid		20 (68)	7 days	B	57	116	-13	52
2-Chloro- <i>p</i> -Toluidine		20 (68)	30 days	B				35
CHX-604 (Hydraulic Fluid)		70 (158)	7 days		78	94	-2	3
Coconut Oil		100 (212)	7 days	B				0.7
Cod Liver Oil		20 (68)	7 days	A				4
Cotton Seed Oil		70 (158)	28 days	A	89	100	-6	0.3
		150 (302)	28 days	A	82	93	-4	2
Creosote Oil		20 (68)	7 days	A	70	80	-10	1
		100 (212)	7 days	A	70	80	-10	9
Cresylic Acid		100 (212)	28 days	A	81	130	-11	11
		150 (302)	28 days	A	68	150	-15	25
Crude Oil		150 (302)	28 days	A	88	85	-4	3
Cyclohexane		20 (68)	7 days	A				4
		20 (68)	10 days	B				0.6
Cyclohexanone		20 (68)	5 days	B			-32	71
		20 (68)	10 days	B			-33	271
Cyclopentanone		20 (68)	5 days	B			-30	272
		20 (68)	10 days	B			-32	280
DBE (Dibasic Esters)		100 (212)	7 days	A	A-500	8	12	141
		100 (212)	7 days	B	B	22	50	103
		100 (212)	7 days	F	GF	35	58	45

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change	
					Tensile Strength	Elongation at Break			
DC-200 Silicone Oil		175 (347)	28 days	A			2	-2	
DECALIN		70 (158)	7 days	B				2	
Delco Supreme II		70 (158)	7 days	A	8	24	-18	76	
Detergent-Bleach Soln	1%	100 (212)	30 days	A	80	96	-1	3	
DEXRON ATF		150 (302)	3 days	A	100	100	0	2	
		150 (302)	3 days	B	73	92	3	2	
		150 (302)	350 hrs	A	94	76	1	2	
		150 (302)	350 hrs	B	67	69	4	2	
		150 (302)	1000 hrs	A	98	86	-1	3	
		150 (302)	1000 hrs	B	63	43	8	3	
Dibutyl Phthalate (DBP)		20 (68)	10 days	B				31	
		121 (250)	5 days	B				20	
Dibutyl Sebacate		20 (68)	8 days	B				14	
		70 (158)	4 days	B				18	
		121 (250)	4 days	B				20	
3,4-Dichloro-aniline		20 (68)	30 days	B				35	
o-Dichloro-benzene		20 (68)	3 days	A			-8	8	
		70 (158)	28 days	A	77	105	-12	10	
		150 (302)	28 days	A	83	120	-15	25	
Dichloroethylene		20 (68)	7 days	A			-19	16	
Diesel Fuel #2		23 (73)	70 hrs	A	A-401C	103	100	-2	3
		23 (73)	70 hrs	F	F-601C	97	104	-1	3
		23 (73)	70 hrs	F	GF	101	103	-2	2
		23 (73)	70 hrs	—	GFLT	93	97	-5	3
Diethyl Benzene		70 (158)	7 days	B				6	
Difluoroethylene		20 (68)	7 days	A				29	
Di-Isobutylene		20 (68)	7 days	A			0	0.8	
Di-Isobutyl Ketone		20 (68)	10 days	B				175	
N,N'-Dimethyl Acetamide (DMAC)		50 (122)	7 days	B		11	19	-40	350
Dimethylformamide		20 (68)	7 days	A		Too soft to test			
		20 (68)	7 days	A				250+	
		20 (68)	7 days	—	VT-R-6186			8	
Dimethyl Phthalate		20 (68)	10 days	B				8	
		121 (250)	5 days	B				30	
Dimethyl Sulfoxide (DMSO)		20 (68)	7 days	B		23	50	-33	142
		20 (68)	28 days	B		22	46	-29	138
Dimethyl Terephthalate (DMT)		20 (68)	10 days					15	
		110 (230)	5 days					50	

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change	
					Tensile Strength	Elongation at Break			
Diocetyl Sebacate		150 (302)	14 days	A	97	94	-4	9	
Dioxane		20 (68)	7 days	A	34	59	-17	128	
		20 (68)	7 days	F	GF	106	-19	52	
DOWTHERM 209									
DOWTHERM 209/H <sub>2</sub> O	54%/46%	98 (208)	3 days	A	60	74	-1	12	
		98 (208)	300 hrs	A	17	14	16	31	
		98 (208)	300 hrs	B	17	9	18	27	
DOWTHERM A		20 (68)	28 days	A			-1		
		100 (212)	28 days	A	87	95	-8	7	
		205 (401)	28 days	A	51	180	-14	22	
D. P. 47		100 (212)	40 days	A	100	100	0	0	
		150 (302)	40 days	A	95	100	0	0	
DV-4709		205 (401)	7 days	A	7	50	-60	340	
Elco L-14374		121 (250)	7 days	A	60	46	3	2	
		121 (250)	3 wks	A	72	30	5	1	
		150 (302)	7 days	A	78	21	11	3	
		150 (302)	3 wks	A	78	19	12	2	
Elco M2C-105A		121 (250)	7 days	A	83	84	2	1	
		121 (250)	3 wks	A	67	48	2	1	
		150 (302)	7 days	A	90	47	5	2	
		150 (302)	3 wks	A	94	47	10	2	
Elco M2C-108A		121 (250)	7 days	A	90	84	1	1	
		121 (250)	3 wks	A	78	74	0	1	
		150 (302)	7 days	A	75	47	5	2	
		150 (302)	3 wks	A	95	42	10	2	
Elco M2C-111A		121 (250)	7 days	A	59	47	2	3	
		121 (250)	3 wks	A	58	37	7	3	
		150 (302)	7 days	A	65	45	6	4	
		150 (302)	3 wks	A	69	37	11	5	
Elco M2C-119A		121 (250)	7 days	A	55	58	5	1	
		121 (250)	3 wks	A	81	47	7	2	
		150 (302)	7 days	A	55	21	11	4	
		150 (302)	3 wks	A	49	32	11	4	
Epichlorohydrin		50 (122)	7 days	A				94	
Esso 20W 50 Oil		150 (302)	7 days	F	GF	66	68	-5	0.8
		150 (302)	28 days	F	GF	55	56	-3	0.8
Esso Aviation No. 100 Oil		70 (158)	3 days	B		92	109	2	0
		70 (158)	7 days	B		92	113	2	0
Esso Transmission Fluid Type A		100 (212)	7 days	A		77	79	-1	2
		150 (302)	40 days	A		74	105	-11	4
ET-387		205 (401)	7 days	B		92	95	0	3

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change	
					Tensile Strength	Elongation at Break			
ETBE (t-Butyl Ethyl Ether)		23 (73)	1 wk	A	E60C	83	94	-4	5
		23 (73)	1 wk	B	B600	76	94	-4	5
		23 (73)	1 wk	F	GF	75	91	-4	3
		23 (73)	1 wk	—	GFLT	67	83	-5	8
		23 (73)	1 wk	—	GLT	74	88	-6	10
		23 (73)	1 wk	—	VT-R-6279	76	106	-4	5
Ethanol		20 (68)	7 days	A		97	100	2	2
		20 (68)	28 days	A				-10	6
Ethanol/ASTM Reference Fuel C—See ASTM Reference Fuel C/Ethanol									
Ethyl Acetate		20 (68)	1 day	A		Too soft to test			280
		20 (68)	7 days	A					280
		20 (68)	7 days	—	VT-R-6186				25
Ethyl Aceto-acetate		20 (68)	7 days	B				-33	168
Ethyl Acrylate		20 (68)	7 days	A					230
Ethylene Diamine		90 (194)	3 days	F	GF	Sample Dissolved			
		90 (194)	3 days	—	VT-R-6186				60
Ethyl Ether		20 (68)	3 days	A				-3	97
Ethylene Glycol/ Distilled Water	50%/50%	100 (212)	28 days	A		80	97		4
		116 (241)	1 mon	A		68	87	8	3
		116 (241)	2 mon	A		67	87	7	4
		150 (302)	28 days	A		74	94		8
2-Ethyl-hexanol		100 (212)	5 days	B					6
		121 (250)	5 days	B					8
Exxon WSX-8762B ATF		163 (325)	3 days	B		80	71	2	1
		163 (325)	7 days	B		74	64	1	2
		175 (347)	3 days	B		67	62	2	2
F-60 Chlorinated Silicone Oil		150 (302)	28 days	A				-5	0.1
F-61 Chlorinated Silicone Oil		150 (302)	28 days	A				-1	0.7
Fluoroboric Acid		20 (68)	165 hrs			113	120		
Fluothane		20 (68)	1 day	A					75
Formaldehyde	37%	20 (68)	7 days	A		110	116	-2	0.7
Formic Acid		70 (158)	7 days	B					83
FR Fluid 20 (Hydraulic Fluid)		70 (158)	7 days			80	106	0	2

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change	
					Tensile Strength	Elongation at Break			
FREON 11		20 (68)	3 wks	A	61	73		18	
		20 (68)	3 wks	B	70	84		22	
		20 (68)	28 days	A	61	77	-18	34	
FREON 11/Sunsiso 3G	50%/50%	150 (302)	7 days	A				16	
FREON 12		20 (68)	28 days	A	46	75	-6	21	
		150 (302)	7 days	A	36	75	-11	20	
FREON 12/ASTM No. 2 Oil	50%/50%	93 (199)	7 days	A				25	
FREON 12/Sunsiso 4G	50%/50%	150 (302)	7 days		30	75	-12	17	
FREON 13 B1 (Bromotrifluoromethane)		20 (68)	28 days	A	46	75	-6	19	
FREON 14 (Tetrafluoromethane)		20 (68)	7days	A	95	98	2	0.6	
FREON 22 (Chlorodifluoromethane) Liquid		20 (68)	20 days	A				90	
		20 (68)	3 wks	A	31	54	-15	77	
		20 (68)	3 wks	B	37	54	-19	84	
		20 (68)	14 days	B				80	
		20 (68)	14 days	F	GF			80	
Vapor		93 (99)	7 days	A				32	
		180 (356)	14 days	B				50	
		180 (356)	14 days	F	GF			60	
FREON 113		20 (68)	28 days	A	38	75	-6	18	
FREON 114B2		20 (68)	7 days	A	46	50	-3	11	
		20 (68)	7 days	B	75	62	-5	11	
FREON 115 (Chloropentafluoroethane)		20 (68)	7 days					16	
FREON 502 Liquid		20 (68)	14 days	B				50	
		20 (68)	14 days	F	GF			66	
	Vapor	180 (356)	14 days	B				28	
		180 (356)	14 days	F	GF			36	
FREON C-318		20 (68)	7 days					16	
FREON MCA		23 (73)	7 days	A	E60C	59	72	-10	25
		23 (73)	7 days	A	A-401C	46	60	-11	26
		23 (73)	7 days	B	B600	52	71	-12	31
		23 (73)	7 days	F	GF	46	72	-14	33
		23 (73)	7 days	—	VT-R-6279	29	48	-19	59
FREON SMT		23 (73)	7 days	A	E60C	42	67	-14	41
		23 (73)	7 days	A	A-401C	42	68	-17	43
		23 (73)	7 days	B	B600	37	69	-20	50
		23 (73)	7 days	F	GF	33	67	-23	49
		23 (73)	7 days	—	VT-R-6279	22	48	-23	67

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change	
					Tensile Strength	Elongation at Break			
FS-1280 Fluorosilicone		70 (158)	7 days				-4	0.6	
FS-1281 Fluorosilicone		70 (158)	7 days				-4	1	
Furfural		70 (158)	28 days	A		21	53	-38	86
		121 (250)	28 days	A		20	43	-38	120
Furfuryl Alcohol		20 (68)	2 days						0.6
		20 (68)	10 days	B					1
		20 (68)	56 days						3
		70 (158)	10 days	B					58
FYRQUEL 150		100 (212)	7 days	A		94	106	-3	13
		100 (212)	7 days	B		96	118	-1	5
		100 (212)	7 days	F	GF	88	86	-3	3
FYRQUEL 220		100 (212)	3 days	A		89	94	-6	10
MIL-G-23652 (Type I)		100 (212)	3 days	B		89	105	-4	4
MIL-G-23652 (Type II)		100 (212)	3 days	A		95	128	-1	7
		100 (212)	3 days	B		86	89	-1	4
Gasoline									
Esso Golden		20 (68)	28 days	A				-6	4
Shell Super		20 (68)	28 days	A				-5	2
Gasoline									
Shell SU-2000 (unleaded)		45 (113)	70 hrs	—	VT-R-6186	65	83	-11	10
		45 (113)	70 hrs	—	VT-R-6279	61	87	-9	11
Gasoline									
Antioxidant No. 22		20 (68)	7 days	A		96	95	0	1
Gasoline, Premium with 26% Aromatic Content, 2.47 g/gal Lead, 2.03 mg/l Antioxidant No. 22		43 (109)	3 days	A		99	100	-7	2
		43 (109)	7 days	A		98	98	-8	4
		43 (109)	14 days	A		101	100	-10	6
Gasoline, Premium with 51% Aromatic Content, 0.1 wt % Antioxidant No. 22		43 (109)	3 days	A		94	100	-8	5
		43 (109)	7 days	A		88	90	-11	8
		43 (109)	14 days	A		101	100	-13	12
Gasoline, Regular		43 (109)	3 days	A		101	100	-6	2
		43 (109)	7 days	A		98	95	-11	3
		43 (109)	14 days	A		101	100	-7	5
Gear Lubricants									
GL-4A		150 (302)	3 days	A		96	99	0	2
GL-4B		150 (302)	3 days	A		96	98	1	1
HD-90		175 (347)	7 days			60	60	-6	4
Lead Soap-Active		150 (302)	3 days	A		99	100	0	1
Sulfur MIL-L-2105		150 (302)	3 days	A		93	97	0	1
SCL		150 (302)	3 days	A		91	99	-1	2
Girling Crimson (Brake Fluid)		70 (158)	14 days	A					56

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change	
					Tensile Strength	Elongation at Break			
Glycerol (Glycerine)		20 (68)	2 days					-0.4	
		20 (68)	28 days					0	
		20 (68)	56 days					-0.5	
		70 (158)	2 days					-0.6	
		70 (158)	28 days					-0.4	
		70 (158)	56 days					-0.1	
		121 (250)	5 days		B			1	
Grease									
Machine Oil No. 120	100 (212)		21 days				-2	1	
Magnet	100 (212)		21 days				-2	2	
Shallow	100 (212)		21 days				-2	2	
Hanover MIL-H-83282	175 (347)		7 days	A	76	105	-4	8	
HEF-2	135 (275)		3 days	A	65	9	24	11	
HERCOFLEX 600	150 (302)		14 days	A	76	100	-14	17	
	150 (302)		14 days	B	66	133	-11	13	
<i>n</i> -Hexane	20 (68)		21 days	A			-10	1	
1-Hexanol	70 (158)		7 days	B				6	
Hexyl Acetate	20 (68)		5 days	B			-30	290	
	20 (68)		10 days	B			-26	308	
Houghto-Safe									
62	70 (158)		14 days	A			-9	8	
520	100 (212)		3 days	A	89	129	-2	9	
	100 (212)		3 days	B	76	121	-6	16	
	100 (212)		3 days	F	GF	82	94	-18	14
	100 (212)		7 days	A			-4	22	
	100 (212)		7 days	B			-8	33	
	100 (212)		7 days	F	GF	57	89	-10	21
1010	70 (158)		7 days	A				13	
1055	100 (212)		14 days	A			-5	20	
1120	70 (158)		14 days	A			-5	9	
	100 (212)		3 days	A	100	112	-3	7	
	100 (212)		3 days	B			-3	3	
	100 (212)		3 days	F	GF	92	100	-5	2
	100 (212)		7 days	A			-1	8	
	100 (212)		7 days	B			-3	4	
	100 (212)		7 days	F	GF	94	106	-5	2
	100 (212)		14 days	A			-12	20	
	150 (302)		14 days	B	88	150	-6	7	
	200 (392)		14 days	B	86	140	-9	12	
Houghton Vital 29 FM	150 (302)		14 days	B	88	140	-8	6	
Hydraulic Fluid	200 (392)		14 days	B	63	100	-11	12	
HTF	288 (550)		3 days	A	31	310	-9	17	
Hydrochloric Acid/Chlorine Gas	135 (275)		46 hrs	F	GF	44	161	-16	



**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change	
					Tensile Strength	Elongation at Break			
Hydrochloric Acid (Muriatic Acid)	37%	20 (68)	7 days	A				2	
		20 (68)	7 days	F	GF	100	108	3	1
		38 (100)	6 mos	B		78	114	2	
		38 (100)	1 yr	B		75	107	0	
		38 (100)	2 yrs	B		79	122	-2	
		38 (100)	3 yrs	B		75	142	-9	9
	70%	70 (158)	3 days	B				2	
	70 (158)	3 days	A					2	
	70 (158)	7 days	A		86	120	-7	3	
	70 (158)	7 days	B		72	200	-10	3	
	70 (158)	7 days	F	GF	84	105	-2	6	
	Hydrochloric Acid (Muriatic Acid) (continued)	70%	70 (158)	7 days	F	GF	75	108	-3
70 (158)			7 days	A		85	118	-6	5
Conc.		20 (68)	30 days	A			5	3	
		20 (68)	30 days	B			-7	14	
		70 (158)	14 days	A	103	117	-1	2	
Hydro-Drive MIH-10 MIH-50		100 (212)	14 days	A			-2	1	
		100 (212)	14 days	A			-2	0.3	
Hydrofluoric Acid	48%	20 (68)	7 days	A			-1	1	
		20 (68)	7 days	B			0	0.7	
		20 (68)	21 days	A			-4	2	
		20 (68)	21 days	B			-2	2	
	75%	70 (158)	5 days	A		81	150	-9	
		100 (212)	5 days	A		60	150	-13	
Hydrogen Fluoride, Gaseous in H <sub>2</sub> O	40%	20 (68)	98 hrs	A	100	95	-1		
		20 (68)	98 hrs	A	82	254	-2		
Hydrogen Fluoride, Liquid, Anhydrous		19 (66)	50 hrs	B				2	
Hydrogen Peroxide	90%	20 (68)	7 days	A	102	106	0	0	
		132 (270)	2 hrs	A	58				
Hydrogen Sulfide Gas at 2.0 MPa (300 psi)		132 (270)	7 days	B	50	95	-9		
Hydrolubric 120B		100 (212)	3 days	A	95	135	-2	6	
		100 (212)	3 days	B	90	137	-1	7	
		100 (212)	3 days	F	GF	98	106	-5	4
		100 (212)	7 days	A	95	135	-6	11	
		100 (212)	7 days	B	83	126	-1	12	
		100 (212)	7 days	F	GF	92	111	-5	6
Hy-Tran 17		70 (58)	7 days	B				8	
Isoamyl Alcohol		150 (302)	60 days	B	106	88	4	21	
		150 (302)	120 days	B	107	79	11	25	
Isobutyl Alcohol		20 (68)	21 days	A			11	1	
Isooctane		20 (68)	21 days	B			0	2	

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change	
					Tensile Strength	Elongation at Break			
Jet Fuels, JP-4		20 (68)	28 days	A			-2	1.7	
		23 (73)	7 days	A	E60C	98	102	1	0
		23 (73)	7 days	A	A-401C	95	98	-1	0
		23 (73)	7 days	B	B600	99	108	-1	0
		23 (73)	7 days	F	GF	80	86	1	0
		23 (73)	7 days	—	GFLT	100	103	-1	1
		70 (158)	7 days	A	E60C	74	83	-5	4
		70 (158)	7 days	A	A-401C	85	103	-7	4
		70 (158)	7 days	B	B600	76	86	-8	5
		70 (158)	7 days	F	GF	78	86	-7	4
		70 (158)	7 days	—	GFLT	98	98	-6	6
	205 (401)	3 days			85	100	-3	12	
JP-5		20 (68)	28 days	A			-1	1	
		23 (73)	7 days	A	E60C	103	108	1	0
		23 (73)	7 days	A	A-401C	100	103	0	0
		23 (73)	7 days	B	B600	95	97	0	0
		23 (73)	7 days	F	GF	93	94	-1	0
		23 (73)	7 days	—	GFLT	98	99	-1	0
		70 (158)	7 days	A	E60C	82	98	-2	1
		70 (158)	7 days	A	A-401C	82	99	0	1
		70 (158)	7 days	B	B600	79	94	-5	2
		70 (158)	7 days	F	GF	80	88	-5	2
		70 (158)	7 days	—	GFLT	97	97	-6	3
	205 (401)	3 days	A					4	
	269 (516)	3 days			Too brittle to test		32	6	
JP-6		38 (100)	6 mos	A		100	95	3	
		38 (100)	1 yr	A		100	95	0	
		38 (100)	2 yrs	A		87	93	-6	0
		38 (100)	3 yrs	A		73	86	-7	
		288 (552)	3 days	A		25	325	-12	18
JP-7		23 (73)	7 days	A	E60C	90	93	0	0
		23 (73)	7 days	A	A-401C	99	103	-1	0
		23 (73)	7 days	B	B600	97	102	-1	0
		23 (73)	7 days	F	GF	98	99	1	0
		23 (73)	7 days	—	GFLT	103	108	-1	0
		70 (158)	7 days	A	E60C	78	92	-2	1
		70 (158)	7 days	A	A-401C	79	107	-4	1
		70 (158)	7 days	B	B600	78	100	-5	1
		70 (158)	7 days	F	GF	87	97	-5	1
		70 (158)	7 days	—	GFLT	85	87	-5	2
Kearsley Thinners		20 (68)	40 days	A			-6	4	
Lacquer		20 (68)	28 days	A		21	45	-30	81
Lactic Acid	85%	158 (316)	7 days	B					11
Ligroin		38 (100)	28 days	A		79	100	-1	2

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change	
					Tensile Strength	Elongation at Break			
Linseed Oil		70 (158)	2 days					0	
		70 (158)	28 days					0	
		70 (158)	56 days					0	
		121 (250)	7 days	B				1	
M-15 Fuel		20 (68)	3 days	F	GF	80	100	-10	7
		54 (129)	7 days	F	GF	57	76	-8	14
		65 (149)	3 days	F	GF	55	81	-25	23
Mack Truck Engine Coolant		82 (180)	428 hrs	A		85	118	-1	3
		82 (180)	428 hrs	F	GF	83	102	-4	2
Methanol		23 (73)	70 hrs	—	GLT				85
		23 (73)	70 hrs	A	E60C	42	58	-20	76
		23 (73)	70 hrs	F	GF	93	103	-2	2
		23 (73)	70 hrs	B	GBL 900	41	66	-19	32
		23 (73)	7 days	A	A-203C	58	60	-43	101
		23 (73)	7 days	B	B401	81	105	-14	9
		23 (73)	7 days	B	B401	69	86	-18	21
Methanol Commercial Grade		20 (68)	7 days	A		75	91	-6	39
		20 (68)	7 days	B					42
		20 (68)	7 days	B		51	165	-27	22
		20 (68)	7 days	F	GF	75	105	-2	3
Methanol/ASTM Reference Fuel C—See ASTM Reference Fuel C/Methanol									
Methanol/Isooctane	50%/50%	60 (140)	1 day	B					42
Methyl Acetate		20 (68)	7 days	B		Too soft to test			180
Methyl Acid		50 (122)	3 days	A					26
Methyl Acrylate		20 (68)	7 days	A		Too soft to test			210
Methylchlorophenyl Silicone Fluid Fluid/Oxidation Inhibitor Grease Grease/Oxidation Inhibitor		205 (401)	40 days	A		119	90	7	4
		205 (401)	40 days	A		112	85	-3	4
		150 (302)	40 days	A		110	109	4	0.7
		150 (302)	40 days	A		89	99	3	17
Methylene Blue		20 (68)	115 hrs	A		Swelled and cracked			
Methylene Chloride		20 (68)	7 days	A					25
		20 (68)	7 days	B		56	109	-19	20
		20 (68)	7 days	F	GF	45	57	-10	16
		20 (68)	7 days	F	GF				16
		20 (68)	7 days	—	VT-R-6186				12
		38 (100)	28 days	A		31	60	18	29
Methyl Ethyl Ketone (MEK)		20 (68)	7 days	A				-51	458
		20 (68)	7 days	B				-43	313
		20 (68)	7 days	—	VT-R-6186				25
		23 (73)	70 hrs	—	VT-R-6186	48	76	-14	19
		23 (73)	70 hrs	—	VT-R-6279	46	77	-13	20
		23 (73)	70 hrs	—	VT-R-6279	54	84	-2	13

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change	
					Tensile Strength	Elongation at Break			
MEK/Toluene	50%/50%	23 (73)	3 days	A				166	
		23 (73)	3 days	B				127	
		23 (73)	3 days	F	GF				87
		23 (73)	3 days	—	VT-R-6186				16
Methyl Isobutyl Ketone		80 (176)	8 days	B				214	
Methyl Isopropyl Ketone		20 (68)	7 days	A				200	
Methyl Methacrylate		20 (68)	3 days	A		Too brittle to test			
Methylphenylsilicone Fluid		205 (401)	40 days	A	116	82	5	-5	
MTBE (t-Butyl Methyl Ether)		23 (73)	70 hrs	A	E60C	38	44	-22	122
		23 (73)	70 hrs	B	B	43	53	-23	100
		23 (73)	70 hrs	F	GF	26	51	-25	74
		23 (73)	70 hrs	—	VT-R-6186	36	67	-13	26
		23 (73)	7 days	A	E60C	26	31	-18	126
		23 (73)	7 days	B	B600	38	46	-19	88
		23 (73)	7 days	F	F-601C	35	49	-22	88
		23 (73)	7 days	F	GF	26	43	-19	59
		23 (73)	7 days	—	GLT	19	25	-15	153
		23 (73)	7 days	—	GFLT	19	29	-19	87
23 (73)	7 days	—	VT-R-6279	69	92	-15	22		
MTBE/Toluene	50%/50%	23 (73)	7 days	—	VT-R-6279	68	111	-11	11
Midcontinent Asphalt, 85-100		205 (401)	1 day	A			-1	6	
		205 (401)	1 day	B			-7	3	
		205 (401)	7 days	A			4	3	
		205 (401)	7 days	B			0	3	
Mine Fluid 3XF		90 (194)	21 days	A	105	105	-9	0.7	
Mineral Oil		100 (212)	7 days	A	106	105			
		100 (212)	7 days	B	103	96			
Mobil Jet Oil II (Mil-L-23699)		150 (302)	21 days	A		74	81	-1	11
		200 (392)	14 days	A		29	44	-15	26
		200 (392)	14 days	B		61	82	-10	16
		205 (401)	3 days	A		77	95	-4	17
		205 (401)	3 days	B		71	79	0	14
		205 (401)	350 hrs	A		26	57	-16	23
		205 (401)	350 hrs	B		26	47	-7	19
		205 (401)	1000 hrs	A		7		-12	38
205 (401)	1000 hrs	B		17		5	29		
Mobil XRM-206A (Mil-H-83282)		121 (250)	6 mos	A	89	108		2	
		175 (347)	7 days	A	82	84	0	2	
Monomethylformamide		50 (122)	7 days	B	37	90	-33	48	
Mono and Dinitrotoluene	40%/60%	77 (171)	11 days	A	65				
Naphtha		20 (68)	7 days	A				4	
		70 (158)	28 days	A	94	113	-11	7	

### Fluid Resistance of Viton® Fluoroelastomer (continued)

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change	
					Tensile Strength	Elongation at Break			
Nitric Acid	10%	66 (151)	28 days	A				41	
	60%	20 (68)	7 days	A				4	
		86 (187)	3 days	A				50	
		86 (187)	3 days	F	GF			19	
	70%	86 (187)	3 days	—	VT-R-6186				11
		20 (68)	3 days	A				0.5	
		20 (68)	3 days	B				0.5	
		20 (68)	7 days	A			-1	4	
		20 (68)	7 days	F	GF	102	119	2	2
		38 (100)	6 mos	B		11	475	-24	22
		38 (100)	12 mos	B		2	510	-35	38
		70 (158)	70 hrs	—	VT-R-6186	41	148	-12	10
		70 (158)	70 hrs	—	VT-R-6279	51	210	-9	13
		70 (158)	3 days	B		38	375	-35	28
		70 (158)	3 days	A					5
		70 (158)	7 days	F	GF	49	165	-20	8
		70 (158)	7 days	B		49	405	-25	15
	70 (158)	7 days	F	GF	45	138	-10	12	
	70 (158)	7 days	A		56	216	-27	21	
	70 (158)	14 days	A		79	253	-14	9	
70 (158)	14 days	B		35	345	-23	8		
Red Fuming	20 (68)	7 days	A					23	
	70 (158)	7 days	A					60	
Nitrobenzene		20 (68)	10 days	B				15	
Nitrogen Dioxide		20 (68)	1 day	A				190	
Nitrogen Tetroxide		20 (68)	7 days	B				280	
Nitropropane		20 (68)	10 days	B				130	
Octanol		20 (68)	35 days	A				0.7	
Oil, American LDO SAE 10-W-30		150 (302)	350 hrs	A	58	71	-2	1	
		150 (302)	350 hrs	B	63	79	1	1	
		150 (302)	3000 hrs	A	43	57	14	2	
		150 (302)	3000 hrs	B	47	63	11	2	
Oils, Engine EOG-1		175 (347)	3 days	A	85	85	-4	1	
Oils, Engine EOG-2		175 (347)	3 days	A	93	90	-2	1	
Oils, Engine EOG-3		175 (347)	3 days	A	75	75	-2	1	
Oils, Engine EOG-4		175 (347)	3 days	A	81	73	-2	1	
Oils, Engine EOG-5		175 (347)	3 days	A	88	86	-2	0.8	
Oils, Engine EOG-6		175 (347)	3 days	A	93	101	-3	1	
Oil, MIL-8200 MIL-L-2104-B		38 (100)	6 mos	A	100	105	2	0.1	
		38 (100)	1 yr	A	90	90	1	0.3	
		38 (100)	2 yrs	A	97	110	-6	0.3	
		38 (100)	3 yrs	A	64	88	-10	1	

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change	
					Tensile Strength	Elongation at Break			
Oil, MIL-L-23699		175 (347)	4 days	A			-20	34	
		175 (347)	4 days	B			-16	22	
		205 (401)	4 days	A			-22	34	
		205 (401)	4 days	B			-8	25	
Oil, MIL-R-83282		121 (250)	14 days	B		92	120	-2	6
		121 (250)	14 days	F	GF	103	130	-2	4
Olein		60 (140)	59 hrs	A	Swelled and cracked				
Olive Oil		20 (68)	7 days	A				4	
ORONITE 8200		38 (100)	3 yrs	A	64	86	-7	2	
		150 (302)	7 days	A	93	100	0	2	
		175 (347)	100 hrs	B	29	44	2	5	
		175 (347)	3 days	A	85	80	2	2	
		175 (347)	3 days	B	93	79	3	2	
		175 (347)	21 days	A			-1	2	
		175 (347)	2000 hrs	A	26	11	16	4	
		175 (347)	2000 hrs	B	27	6	13	6	
		205 (401)	3 days	A	105	100	2	1	
		205 (401)	3 days	B	96	97	-3	2	
		205 (401)	7 days	A	50	58	1	1	
	205 (401)	28 days	A	Too brittle to test		13	2		
ORONITE 8515		175 (347)	3 days	A	72	85	-10	5	
		175 (347)	21 days	A			-2	4	
		175 (347)	28 days	A	Too brittle to test		6	-8	
		205 (401)	3 days	A	72	85	-2	4	
		205 (401)	7 days	A	70	61	1	5	
		205 (401)	7 days	B	80	68	-1	4	
		205 (401)	21 days	A	40	30	3	8	
		205 (401)	21 days	B	43	29	0	7	
ORONITE Hyjet (Hydraulic Fluid)		150 (302)	7 days	A	7	22	-54	264	
		150 (302)	7 days	B	14	41	-56	177	
ORONITE Hyjet W (Hydraulic Fluid)		150 (302)	7 days	A	10	24	-53	243	
		150 (302)	7 days	B	15	53	-56	159	
ORONITE M2V		200 (392)	7 days	A	85	114	-7	4	
		200 (392)	7 days	B	60	92	-12	8	
OS-45	Type III	205 (401)	3 days	A	80	91	0	6	
	Type III	205 (401)	7 days	A	62	67	-3	11	
	Type IV	175 (347)	21 days	A			-3	9	
	Type IV	260 (500)	3 days	A			-1	9	
		205 (401)	7 days	A	82	85	-1	3	
		205 (401)	7 days	B	75	98	-2	3	
		205 (401)	21 days	A	56	48	4	4	
		205 (401)	21 days	B	67	54	0	4	
OS-124		205 (401)	7 days	B	0	-13	-2	2	
		260 (500)	7 days	B	53	7	22	3	
Parapoid 10-C		150 (302)	3 days	A	Sample disintegrated				

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change	
					Tensile Strength	Elongation at Break			
Pentalube TP-653		205 (401)	7 days	B	69	96	-22	21	
Pent-oxol		20 (68)	7 days	B	19	30	-34	220	
Pent-oxone		20 (68)	7 days	B	13	18	-37	284	
Perchloroethylene		20 (68)	7 days	A			-10	6	
		38 (100)	6 mos	A	92	81	-2		
		38 (100)	1 yr	A	98	100	-3		
		38 (100)	2 yrs	A	92	93	-9		
Perchloroethylene (continued)		38 (100)	3 yrs	A	87	95	-7	5	
		70 (158)	3 days	A	86	108	-2	9	
		70 (158)	3 days	B	82	108	-3	9	
		70 (158)	333 hrs	A	88	108	-5	8	
		70 (158)	333 hrs	B	82	108	-6	9	
		70 (158)	28 days	A	87	100	-9	8	
		100 (212)	28 days	A	89	105	-9	11	
Perchloryl Fluoride		20 (68)	7 days	B				73	
Phenol		70 (158)	28 days	A	85	100	-11	7	
		100 (212)	3 days	A				3	
		100 (212)	3 days	F				1	
		100 (212)	3 days	—	GF VT-R-6186			1	
		100 (212)	28 days	A	89	140	-14	10	
		150 (302)	28 days		57	210	-19	24	
Phenol Sulfonic Acid	65% Tech.	66 (151)	7 days	B			2	2	
Phenylenediamine (PDA)		131 (268)	8 days	A		Dissolved			
Phosphoric Acid	60%	100 (212)	28 days	A	89	110	-8	4	
Phthalic Anhydride		205 (401)	1 day	A	85	87	19	98	
		205 (401)	1 day	B	75	113	9	42	
β-Pinene		70 (158)	7 days	B			6		
Potassium Hydroxide	Saturated	100 (212)	7 days	A		Sample Dissolved			
		100 (212)	7 days	—	VT-R-6186			3	
	30%	150 (302)	3 days	F	GF	Sample Dissolved			
		150 (302)	3 days	—	VT-R-6186			12	
	45%	200 (392)	3 days	F	GF	Sample Dissolved			
		200 (392)	3 days	—	VT-R-6186	Cracked			
		70 (158)	70 hrs	—	VT-R-6186	99	100	0	0
		70 (158)	70 hrs	—	VT-R-6279	95	103	0	0
Potassium Permanganate	30%	70 (158)	5 days	A			-11	28	
PQ-1307 Hydraulic Oil (MIL-H-6083)	30%	70 (158)	5 days	B			-7	14	
		60 (140)	7 days	A	85	100	3	0.5	
Propanol		20 (68)	8 days	B				0.6	
		20 (68)	21 days	A			10	2	
		70 (158)	4 days	B				6	
<i>n</i> -Propyl Acetate		20 (68)	8 days	B				200	

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change
					Tensile Strength	Elongation at Break		
<i>n</i> -Propyl Nitrate		20 (68)	7 days	A			-38	140
Pydraul 60		66 (151)	24 hrs					60
150		70 (158)	28 days	B			-6	9
312		100 (212)	28 days	B	72	120	-10	10
		70 (158)	7 days	A	91	118	6	2
		100 (212)	7 days	A	89	118	5	5
		121 (250)	14 days	B	110	130	0	4
		121 (250)	14 days	F	104	110	0	3
		121 (250)	350 hrs	A	85	103	3	6
		121 (250)	350 hrs	B	95	105	0	5
		121 (250)	2000 hrs	A	78	103	-2	6
		121 (250)	2000 hrs	B	90	121	-2	6
Pydraul A-200		70 (158)	28 days	B			-3	3
		100 (212)	28 days	B	83	100	-6	3
Pydraul AC		70 (158)	28 days	A			-1	2
Pydraul F-9		70 (158)	7 days	A			-1	2
PYRANOL		100 (212)	4 days	B				4
Pyridine		20 (68)	3 days	A			-15	120
		20 (68)	7 days	A	21	67	-25	119
Pyridine/Toluene (5/95)—See Toluene/Pyridine								
RD-6195		150 (302)	40 days	A	57	132	-5	3
		200 (392)	40 days	A	39	36	-6	20
RJ-1		20 (68)	28 days	A			-2	1
RP-1		20 (68)	28 days	A			-4	1
Royco 808-RH		205 (401)	3 days	A	50	100	-20	18
		205 (401)	3 days	B	59	115	-15	23
899		205 (401)	3 days	A	66	96	-14	19
(Mil-L-23699)		205 (401)	3 days	A	78	130	-6	12
SANTOSAFE 300		70 (158)	7 days	A	91	118	3	1
		100 (212)	7 days	A	83	110	5	3
Satfa EC-3686 (Transmission Fluid)		135 (275)	3 days	B	89	80	1	4
Shell Air		175 (347)	3 days	B	85	133	-6	13
GG-1034 WTR		175 (347)	7 days	B	90	80	-1	17
Shell Air Turbine Oil		205 (401)	3 days	A	47	78	-22	31
No. 505 (Mil-L-23699)		205 (401)	3 days	B	71	140	-9	18
Shell F. R. Fluid		150 (302)	20 days	A			-5	5
Shell Iris 902		66 (151)	28 days	A			-2	5
Shell Rotella T 15W40		150 (302)	7 days	A	68	68	1	0.3
Diesel Oil		150 (302)	7 days	B	69	84	-3	0.6



**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change
					Tensile Strength	Elongation at Break		
Shell Rotella T 15W40 Diesel Oil (continued)	150 (302)	7 days	F	GF	63	80	-4	0.3
	150 (302)	42 days	A		62	49	2	1
	150 (302)	42 days	B		60	61	-5	0.6
	150 (302)	42 days	F	GF	56	54	0	0.3
Shell Spirax EP90	150 (302)	7 days	F	GF	81	104	-4	1
Shell Spirax HD (Rear Axle Lubricant)	150 (302)	14 days	F	GF	67	71	0	2
Shell Super Oil/ STP Oil Additive	150 (302)	7 days	B		74	96	-1	2
	150 (302)	7 days	A		45	62	0	2
	150 (302)	14 days	A		43	48	1	1
	150 (302)	14 days	B		73	71	0	1
Shell Tellus 33	70 (158)	28 days	A				-1	0.6
Shell Turbine No. 307	200 (392)	3 days	A		59	100	-14	24
	200 (392)	3 days	B		75	90	-11	16
Shinol TWS-R	20 (68)	165 hrs			106	120		
SKYDROL LD	121 (250)	3 days	A					196
	121 (250)	3 days	B					149
	121 (250)	3 days	F	GF				80
	121 (250)	3 days	—	VT-R-6186				11
SKYDROL 500A	150 (302)	7 days	A		11.4	22	-52	266
	150 (302)	7 days	B		12	45	-54	174
SKYDROL 500B	100 (212)	7 days	A		27	61	-22	171
	121 (250)	7 days	B		23	90	-44	151
	121 (250)	7 days	F	GF	50	81	-20	145
	121 (250)	14 days	B		35	60	-27	92
	121 (250)	14 days	F	GF	62	90	-22	31
	125 (257)	3 days	F	GF				25
	125 (257)	3 days	—	VT-R-6186				10
	125 (257)	7 days	A					171
	125 (257)	7 days	B					151
	125 (257)	7 days	F	GF				45
	125 (257)	7 days	—	VT-R-6186				20
	150 (250)	7 days	A		13	35	-54	236
	150 (250)	7 days	B		16	61	-56	139
Skylube 450	200 (392)	3 days	A		36	33	-4	15
	200 (392)	3 days	B		34	61	-5	12
	200 (392)	14 days	A		14	19	-4	24
	200 (392)	14 days	B		13	30	-1	17
SOC-100, SAE10W40 Synthetic Engine Oil	150 (302)	3 days	B		82	71	1	2
	150 (302)	7 days	B		74	70	1	2
	175 (347)	3 days	B		74	57	1	3
	175 (347)	7 days	B		67	52	3	4
Sodium, Liquid	121 (250)	1 day	A		88	93	0	
	175 (347)	1 day			78	112	-4	

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change	
					Tensile Strength	Elongation at Break			
Sodium, Vapor (N <sub>2</sub> Atmosphere)		175 (347)	7 days			102	97	-1	
Sodium Hydroxide	30%	70 (158)	14 days	A		53	114	-10	34
		100 (212)	3 days	F	GF		Cracked		
		100 (212)	3 days	—	VT-R-6186				0
	46.5%	20 (68)	7 days	A		75	100	1	2
		38 (100)	6 mos	B		73	86	-5	
		38 (100)	1 yr	B		54	81	-6	
		38 (100)	2 yrs			32	67	-9	
		38 (100)	3 yrs			17	62	-17	
	50%	70 (158)	14 days	B		69	115	3	-7
70 (158)		14 days	F	GF	47	120	-2	-8	
Sodium Hypochlorite	5%	20 (68)	28 days	A					0.8
		70 (158)	28 days	A		89	110	-6	24
Sodium Thiosulfate		50 (122)	7 days	A					1
		50 (122)	7 days	B					0.5
Soybean Oil		121 (250)	7 days	B					0.4
Spirax 90 EP Oil/ STP Oil Additive		150 (302)	7 days	A		57	67	1	3
		150 (302)	7 days	B		91	100	-1	4
		150 (302)	14 days	A		58	76	-1	2
		150 (302)	14 days	B		93	100	-1	3
Stannous Fluoroborate		20 (68)	165 hrs			109	120		
Stauffer 7700		175 (347)	350 hrs	A		63	63	-8	23
		175 (347)	350 hrs	B		75	100	-7	17
		175 (347)	1000 hrs	A		89	160	-8	17
		175 (347)	1000 hrs	B		45	160	-14	20
		175 (347)	2000 hrs	A		40	40	-7	39
		175 (347)	2000 hrs	B		57	79	-10	26
		175 (347)	70 hrs	A	E60C	85	94	-8	15
		175 (347)	70 hrs	A	A-401C	86	97	-7	14
		175 (347)	70 hrs	B	B600	91	104	-7	10
		175 (347)	70 hrs	F	F-601C	98	120	-6	7
		175 (347)	70 hrs	—	GLT	79	92	-8	18
		175 (347)	70 hrs	—	GFLT	91	98	-5	8
		200 (392)	70 hrs	A	E60C	84	93	-9	16
		200 (392)	70 hrs	A	A-401C	78	91	-9	15
		200 (392)	70 hrs	B	B600	94	112	-8	10
		200 (392)	70 hrs	F	F-601C	92	127	-5	7
		200 (392)	70 hrs	—	GLT	76	91	-9	18
		200 (392)	70 hrs	—	GFLT	87	97	-9	8
		200 (392)	3 days	A		79	100		23
		200 (392)	7 days	B		67	170	-19	14
		200 (392)	7 days	F	GF	78	105	-3	8
		200 (392)	14 days	B		75	104		23
	Stauffer Jet II (Mil-L-23699B)		175 (347)	3 days	A		96	91	-10
		175 (347)	3 days	B		92	117	-5	8
		175 (347)	3 days	F	GF	99	102	-5	5

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change		
					Tensile Strength	Elongation at Break				
Steam		125 (257)	50 days			64	75	-9		
		150 (302)	21 days			70	81	-7		
		162 (324)	7 days	A		73	95	0	6	
		162 (324)	7 days	F	GF	94	105	4	1	
		162 (324)	9 days	B		45	91	-13		
		162 (324)	21 days	A		49	70	-5	13	
		162 (324)	21 days	F	GF	87	105	2	2	
		162 (324)	1000 hrs	A		82	106	7	-2	
		162 (324)	1000 hrs	B		34	140	-11	4	
		170 (338)	4 days	A				-3	0.7	
		175 (347)	6 days			46	87	-3		
		175 (347)	50 days			15	49	-13		
		197 (387)	7 days	A		29	49	16		
		200 (392)	8 hrs	A				-1	1	
		204 (399)	7 days	F	GF	82	110	-1	1	
		204 (399)	14 days	F	GF	68	114	-5	2	
		1.4 MPa (200 psig)	24 hrs	A		89	176	2	2	
			24 hrs	B		42	230	-7	3	
	Styrene (Styrene Monomer)		20 (68)	7 days	B					6
			20 (68)	28 days	A			-16		11
		50 (122)	7 days	A					31	
Sulfole		20 (68)	7 days	B					-0.1	
Sulfur Dichloride		20 (68)	2 days	B					3	
Sulfuric Acid	20%	100 (212)	3 days	F	GF	102	106	2	-2	
	40%	115 (239)	28 days						27	
	60%	70 (158)	28 days	A		90	90	-11	0.5	
		121 (250)	28 days	A		90	100	-5	10	
	90%	38 (100)	6 mos	B		119	95	2		
		38 (100)	1 yr	B		103	100	2		
		38 (100)	2 yrs	B		101	98	3		
		38 (100)	3 yrs	B		102	86	3	1	
		95 (203)	7 days	A					12	
		95%	20 (68)	14 days	A		104	100	6	0.5
	20 (68)		14 days	B		99	95	0	0.2	
		70 (158)	28 days	A		88	90	1	5	
		70 (158)	70 hrs	—	VT-R-6186	103	107	0	1	
		70 (158)	70 hrs	—	VT-R-6279	96	90	0	2	
		90 (194)	7 days	—	VT-R-6186	99	96	-1	3	
		90 (194)	7 days	—	VT-R-6279	94	82	-1	3	
	98%	20 (68)	7 days	F	GF	101	108	-2	7	
		20 (68)	30 days	A				6	10	
		20 (68)	30 days	B				-5	7	
	Fuming	20 (68)	7 days	A				-5	3	
		20 (68)	7 days	B				-2	4	
		20 (68)	36 days	A				8	28	
conc.	150 (302)	5 days	B	B	65	97	-15	39		
	150 (302)	5 days	B	B600	68	93	-9	26		
	150 (302)	10 days	B	B	51	173	-35	61		
	150 (302)	10 days	B	B600	73	152	-20	43		
Sulfurous Acid		23 (73)	7 days	B	B401	89	102	-30	28	
Sulfurous Acid (5% SO <sub>2</sub> )		20 (68)	7 days	A			Severely cracked and swelled			

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change	
					Tensile Strength	Elongation at Break			
Sun XSC 71 367 Oil		150 (302)	3 days	A	108	70	-3	-1	
		150 (302)	3 days	B	81	77	-2	-2	
Sunoco Sunomatic 136 ATF		121 (250)	14 days	B	96	104	2	0.6	
		121 (250)	1000 hrs	B	95	100	-4	1	
		150 (302)	14 days	B	94	109	0	1	
Sunoco Sunomatic 141 ATF		150 (302)	3 days	A	72	65	3	2	
		150 (302)	3 days	B	82	73	0	2	
		163 (334)	3 days	B	79	68	1	1	
		163 (325)	7 days	B	69	59	0	2	
		175 (347)	3 days	B	76	64	0	2	
Sunoco X5 820 EP Lube		150 (302)	3 days	A	87	100	0	6	
		150 (302)	3 days	B	98	105	0	3	
Super 284 OS19381 (Transmission Fluid)		135 (275)	3 days	B	85	73	3	3	
Supermil ASU-06752		175 (347)	3 days	B	66	87	-5	19	
		175 (347)	7 days	B	39	40	2	32	
TEL-4081		175 (347)	70 hrs	A	E60C	91	107	-9	16
		175 (347)	70 hrs	A	A-401C	85	99	-8	16
		175 (347)	70 hrs	B	B600	90	113	-6	10
		175 (347)	70 hrs	F	F-601C	95	124	-5	7
		175 (347)	70 hrs	—	GLT	82	95	-8	18
		175 (347)	70 hrs	—	GFLT	95	97	-5	8
		200 (392)	70 hrs	A	E60C	85	104	-9	18
		200 (392)	70 hrs	A	A-401C	79	96	-8	18
		200 (392)	70 hrs	B	B600	90	115	-6	11
		200 (392)	70 hrs	F	F-601C	86	131	-5	8
		200 (392)	70 hrs	—	GLT	79	95	-8	19
	200 (392)	70 hrs	—	GFLT	94	95	-5	8	
Tetrachloroethane		20 (68)	21 days	A			10	3	
Tetrachloroethylene		20 (68)	2 wks	B				2	
Tetrahydrofuran		20 (68)	6 days	B				281	
		20 (68)	7 days	A				380	
		20 (68)	7 days	B				281	
		20 (68)	7 days	—	VT-R-6186				40
Texaco 3450		150 (302)	7 days	A	95	100	2	9	
		150 (302)	21 days	A	78	86	-7	26	
Texaco TL-8262B ATF		121 (250)	14 days	B	88	100	-1	1	
		121 (250)	1000 hrs	B	95	100	-4	1	
		150 (302)	14 days	B	90	96	-2	2	
Texamatic Fluid		175 (347)	7 days	A	90	95	2	3	
		175 (347)	7 days	A	80	88	-2	1	
		175 (347)	7 days	A	95	95	0	2	
		175 (347)	7 days	A	80	82	2	2	
Thionyl Chloride		20 (68)	28 days	A	46	83	-20	22	

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change		
					Tensile Strength	Elongation at Break				
T J 35		205 (401)	3 days	B	84	126	-9	9		
		205 (401)	7 days	B	82	110	-10	10		
		250 (482)	20 days	A	65	73	-20	29		
Toluene		23 (73)	70 hrs	—	GLT			25		
		23 (73)	70 hrs	—	GFLT			5		
		38 (100)	6 mos	A		54	72	-12		
		38 (100)	1 yr	A		54	72	-14		
		38 (100)	2 yrs	A		64	86	-23		
		38 (100)	3 yrs	A		52	75	-19		
		50 (122)	24 hrs			67	83	-17	22	
		70 (158)	7 days	B		59	80	-10	13	
		70 (158)	7 days	F	GF	73	100	-3	4	
		70 (158)	70 hrs	—	VT-R-6186	75	97	-9	8	
	70 (158)	70 hrs	—	VT-R-6279	65	83	-10	9		
Toluene/Acetone (50/50)—See Acetone/Toluene										
Toluene/Pyridine	95%/5%	70 (158)	14 days	B		61	100	-18	26	
		70 (158)	14 days	F	GF	73	100	-14	17	
Toluene -2,4 diisocyanate/ Toluene -2,6 diisocyanate	80%/20%	20 (68)	8 days						1	
Transmission Fluid, Ford		175 (347)	3 days	B		80	100	0	1	
Transmission Fluid										
ATF 1		175 (347)	3 days	A		76	84	-1	3	
ATF 2		175 (347)	3 days	A		77	82	-1	2	
ATF 3		175 (347)	3 days	A		75	78	-1	2	
ATF 4		175 (347)	3 days	A		76	80	0	2	
ATF 5		175 (347)	3 days	A		53	61	-1	2	
Cities XPA-1668 ATF		150 (302)	70 hrs	A	E60C	68	72	0	2	
		163 (325)	7 days	A	A-200	53	50	-4	1	
		163 (325)	7 days	—	GFLT	72	74	-1	1	
		163 (325)	6 wks	A	A-200	47	35	5	2	
		163 (325)	6 wks	—	GFLT	58	60	0	1	
DEXRON II ATF (Kendall)		150 (302)	70 hrs	A	E45	63	70	1	2	
		150 (302)	70 hrs	A	E45	94	89	1	1	
		150 (302)	70 hrs	B	B401	80	87	1	2	
		150 (302)	70 hrs	B	B401	99	95	-1	1	
DEXRON II ATF (Quaker State)		150 (302)	70 hrs	A	E60C	42	46	4	1	
		150 (302)	70 hrs	A	E45	41	48	2	1	
		150 (302)	70 hrs	A	E45	73	69	3	1	
		150 (302)	70 hrs	B	B401	51	60	3	1	
		150 (302)	70 hrs	B	B401	76	69	0	1	
		150 (302)	70 hrs	A	E60C	53	60	3	2	
DEXRON II ATF (Texaco)		150 (302)	70 hrs	A	E45	54	63	2	2	
		150 (302)	70 hrs	A	E45	84	83	4	2	
		150 (302)	70 hrs	B	B401	63	93	3	2	
		150 (302)	70 hrs	B	B401	88	80	1	1	
	Exxon FN-1973 ATF		163 (325)	7 days	A	A-200	39	27	3	1
			163 (325)	7 days	—	GFLT	83	82	0	1
		163 (325)	6 wks	A	A-200	39	22	4	3	
		163 (325)	6 wks	—	GFLT	59	65	0	1	

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change	
					Tensile Strength	Elongation at Break			
Exxon FN-1975 ATF		163 (325)	7 days	A	A-200	52	49	2	1
		163 (325)	7 days	—	GFLT	77	77	2	1
		163 (325)	6 wks	A	A-200	45	32	4	3
		163 (325)	6 wks	—	GFLT	60	63	0	2
TREFLAN		20 (68)	1 mon	B		83	118	0	3
		20 (68)	1 mon	F	GF	91	144	0	2
Tributyl Phosphate		100 (212)	7 days	A					380
		150 (302)	7 days	A					400
1-1-1 Trichloroethane		20 (68)	7 days						11
Trichloroethane		20 (68)	21 days	A				10	3
		100 (212)	28 days	A		31	60	28	46
Trichloroethylene		20 (68)	7 days	A					10
		20 (68)	7 days	B		62	175	-18	9
		20 (68)	7 days	F	GF	65	86	-5	7
		20 (68)	2 wks	B					6
		70 (158)	28 days	A		61	95	-12	15
Trichloroethylene/ Tetrachloroethylene		20 (68)	2 wks	B					4
Tricresyl Phosphate		38 (100)	6 mos	A		98	100	0	
		38 (100)	1 yr	A		90	90	-3	
		38 (100)	2 yrs	A		92	98	-12	
		38 (100)	3 yrs	A		72	85	-9	13
		100 (212)	14 days	A		76	106	-13	21
		100 (212)	14 days	B		83	118	-4	5
		150 (302)	7 days	A		84	104	-7	21
		150 (302)	7 days	B		93	110	-3	7
		150 (302)	14 days	A		74	86	-2	20
		150 (302)	14 days	B		81	125	-6	7
		150 (302)	21 days	B		71	83	-3	7
		150 (302)	21 days	A		62	70	-13	18
	Triethylaluminum		71 (160)	30 days	A				
Triethylborane		71 (160)	30 days	A					5
Trioxane		70 (158)	7 days	B					23
Turbo No. 10 Oil		70 (158)	3 days	B		96	115	-2	0.4
		70 (158)	7 days	B		94	121	2	0.3
Turbo No. 65 Oil		70 (158)	3 days	B		92	106	0	0
		70 (158)	7 days	B		92	118	2	0
Turbo No. P-16 Oil		70 (158)	3 days	B		79	121	0	2
		70 (158)	7 days	B		77	127	2	2
Turpentine		70 (158)	28 days	A		84	105	-7	8.6
UCON* 300N Lubricants 50-HB-280X		205 (401)	14 days	B				2	3

**Fluid Resistance of Viton® Fluoroelastomer (continued)**

Fluid	Concentration	Temperature, °C (°F)	Time	Polymer Type	% of Original Property Retained		Durometer A, Points Change in Hardness	% Volume Change	
					Tensile Strength	Elongation at Break			
Univis J-43		70 (158)	28 days	A			0	2	
		121 (250)	6 mos	A	66	105		15	
		135 (275)	7 days	A	89	100	-1	3	
		175 (347)	7 days	A	87	89	-1	4	
Univolt 35		70 (158)	7 days	B				0.8	
Veedol Hypoid Oil		180 (356)	100 hrs	A				2	
VERNAM		20 (68)	1 mon	B	69	118	-10	12	
		20 (68)	1 mon	F	GF	88	133	-7	2
Versilube F-50		175 (347)	28 days	A			2	-3	
		260 (500)	3 days	A			8	-3	
Vinyl Acetylene		-20 (-4)	7 days	A			-2	7	
Vinyl Fluoride		20 (68)	7 days	A				12	
Water		20 (68)	30 days	A			5	0.6	
		20 (68)	30 days	B			-5	0.8	
		70 (158)	6 mos	A	69	100	0	3	
		70 (158)	1 yr	A				11	
		70 (158)	2 yrs	A	80	130	6	5	
		100 (212)	7 days	A	E60C	84	124	-3	3
		100 (212)	7 days	F	GF	103	105	-3	1
		100 (212)	7 days	B	GBL 900	106	114	-5	0
		100 (212)	10 days	A		104	111	-1	1
		100 (212)	28 days	A		99	117	2	0.3
		100 (212)	28 days	B		83	125	-18	0.7
		100 (212)	30 days	A		104	117	0	2
		150 (302)	2 wks	B	GBL 900	65	160	-5	2
		162 (324)	7 days	A		86	95	6	9
		162 (324)	7 days	F	GF	86	105	-7	5
		162 (324)	21 days	A		84	110	4	11
		162 (324)	21 days	F	GF	94	121	-3	5
	170 (338)	4 days	A						
	170 (338)	192 hrs	A				-3	4	
	175 (347)	6 days	A		50	126	4		
Water/Glycantin 1:1		90 (194)	100 hrs	A				2	
Water, Distilled/Ethylene Glycol (50%/50%)—See Ethylene Glycol/Water, Distilled									
Water + 1% Soluble Oil		90 (194)	100 hrs	A				5	
Xylene		70 (158)	28 days	A	66	85	-16	18	
<i>m</i> -Xylene		20 (68)	10 days	B				5	





## Appendix Proprietary Fluids

Name	Composition	Description	Supplier	Pertinent Spec.
ADIPRENE-L-167	—	Fully saturated urethane polymer	DuPont Co. Elastomers Polymer Products	—
Aeroshell 100	Mineral oil base plus additives	Aviation piston engine lubricating oil	Shell Oil Co.	D. Eng. DRD 2472B
Aeroshell Fluid No. 4	Mineral oil plus tritolyphosphate	Hydraulic fluid	Shell Oil Co.	DTD 585
Aeroshell Turbine Oil 760	Diester base	Aviation turbine lubricant	Shell Oil Co.	D. Eng. DRD 2487
Anderol L-774	Di-2-ethylhexyl sebacate with 1/2% phenothiazine	Diester rubber test oil	Lehigh Chem. Co.	Mil-L-7808 D
Anderol L-826	Diester base	High temperature lubricant (Medium viscosity)	Lehigh Chem. Co.	—
Anderol L-829	Diester base	High temperature lubricant (High viscosity)	Lehigh Chem. Co.	—
ASTM Hydrocarbon Test Fluid	92% ASTM Oil No. 1 8% Parapoid 10-C	SAE-ASTM (ASTM-D735)	Exxon Chem. Co.	—
ASTM Oil No. 1	Petroleum	High aniline point lubricating oil	Exxon Chem. Co.	—
ASTM Oil No. 3	Petroleum	Low aniline point lubricating oil	Sun Oil Co.	—
ASTM Reference Fuel A	Iso-octane	Test fuel	—	Mil-S-3136A Type I
ASTM Reference Fuel B	70% Iso-octane 30% Toluene	Test fuel	—	Mil-S-3136A Type III
ASTM Reference Fuel C	50% Iso-octane 50% Toluene	Test fuel	—	—
Automotive Fuel 2B	32% Aromatic hydrocarbons 48% Paraffinic hydrocarbons 20% Ethyl alcohol	Fuel	—	—
Automotive Fuel RF2	40% Aromatic hydrocarbons 60% Paraffinic hydrocarbons	Fuel	—	—
Automotive Fuel 60	60% Aromatic hydrocarbons 40% Paraffinic hydrocarbons	Fuel	—	—
Automotive Fuel 60B	48% Aromatic hydrocarbons 32% Paraffinic hydrocarbons 20% Ethyl alcohol	Fuel	—	—
Avtag	Wide cut gasoline	Aviation turbine fuel	Shell Oil Co.	D. Eng. DRD 2486
Avtur	Kerosene (25% max. aromatics)	Aviation turbine fuel	Shell Oil Co.	D. Eng. DRD 2482

**Appendix**  
**Proprietary Fluids (continued)**

Name	Composition	Description	Supplier	Pertinent Spec.
B.P. Aero Hydraulic Fluid No. 1	Mineral oil plus tri-tolyl phosphate	Hydraulic fluid	British Petroleum Co. Ltd.	DTD 585
Bray Oil 762	Petroleum base	Fire resistant hydraulic fluid	—	Mil-O-5606
Bunker Fluid C	Petroleum base	6000 second fluid oil	—	—
Catalene "B"	Iso-propyl nitrate	—	—	—
CELLOSOLVE	2-Ethoxy ethanol-1	Alcohol	Union Carbide Chem. Co.	—
CELLULUBE	Triaryl phosphate ester	Hydraulic fluid	Celanese Chem. Co.	Mil-H-19457 (ships)
CELLULUBE 220	Triaryl phosphate ester (high viscosity)	Hydraulic fluid	Celanese Chem. Co.	Mil-H-19457 (ships)
CELLULUBE 550A	Triaryl phosphate ester	High temperature lubricant	Celanese Chem. Co.	Mil-L-9236 A
Chlorextol	—	Transformer oil	Allis-Chalmers Mfg. Co.	—
DC-200	Dimethyl-polysiloxane	Silicone oil lubricant	Dow Corning Corp.	—
DOWTHERM A	75% Diphenyl oxide 25% Diphenyl	Heat transfer fluid	Dow Chem. Co.	—
D. P. 47	Silicone base	Fire resistant hydraulic fluid	Imperial Chem. Industry, Ltd.	— —
DV-4709	Camphorate ester of fluoroalcohols	Thermally stable jet engine lubricant	—	—
EOG-1	Viscosity index, 111 Aniline point 108°C	Engine oil	—	—
EOG-2	Viscosity index, 103 Aniline point 105°C	Engine oil	—	—
EOG-3	Viscosity index, 51 Aniline point 97.2°C	Engine oil	—	—
EOG-4	Viscosity index, 144 Aniline point 99.5°C	Engine oil	—	—
EOG-5	Viscosity index, 97 Aniline point 103°C	Engine oil	—	—
EOG-6	Viscosity index, 138 Aniline point 104°C	Engine oil	—	—
ET-387	Mixed isomers of bis (phenoxyphenyl) ether	High temperature lubricant	Dow Chem. Co.	Mil-L-9236 A
Exxon Aviation Fuel	Petroleum base	Fuel	Exxon Corp.	—

**Appendix**  
**Proprietary Fluids** (continued)

Name	Composition	Description	Supplier	Pertinent Spec.
F-60, 61	Chlorinated silicone oil (60-low viscosity, 61-high viscosity)	High temperature, oxidation resistant lubricant	Dow Chem. Co.	—
Fluothane	2-Bromo, 2-chloro 1,1,1-trifluoroethane	Inhalation anesthetic	—	—
Ford Transmission Fluid	Petroleum Base	Transmission fluid	Ford Motor Co.	—
FREON 11	Trichlorofluoromethane	Refrigerant and propellant	DuPont Co. FREON Products	—
FREON 12	Dichlorodifluoromethane	Refrigerant and propellant	DuPont Co. FREON Products	—
FREON 13B1	Bromotrifluoromethane	Refrigerant and fire extinguishing agent	DuPont Co. FREON Products	—
FREON 14	Tetrafluoromethane	—	DuPont Co. FREON Products	—
FREON 22	Chlorodifluoromethane	Refrigerant and propellant	DuPont Co. FREON Products	—
FREON 113	Trichlorotrifluoroethane	Refrigerant and propellant	DuPont Co. FREON Products	—
FREON 114B2	Dibromotetrafluoroethane	Refrigerant, fire extinguishing agent and control fluid	DuPont Co. FREON Products	—
FREON 115	Chloropentafluoroethane	Refrigerant and propellant	DuPont Co. FREON Products	—
FREON C 318	Octafluoro-tetraethylene	Refrigerant and propellant	DuPont Co. FREON Products	—
FS-1280	Fluorosilicone	—	Dow Corning Corp.	—
FS-1281	Fluorosilicone	—	Dow Corning Corp.	—
Gasoline Antioxidant No. 22	N-N' (sec butyl)-p-phenylene Diamine	Antioxidant	DuPont Co. Petrochemicals	—
Gear Lube HD90	—	Rear axle oil	—	—
Girling Crimson	—	Brake fluid	Lucas Indus., Inc.	—
Lead Soap- Active Sulfur	3.56% sulfur 2.75% lead	Gear lubricant	—	—
Mil-L-2105	15% additive meeting Mil-L-2105 in base oil with aniline point 120°C	Gear lubricant	—	—
SCL	Sulfur-chlorine-lead, sulfurized sperm oil 3% sulfur, 1.7 lead	Gear lubricant	—	—

**Appendix**  
**Proprietary Fluids** (continued)

Name	Composition	Description	Supplier	Pertinent Spec.
HEF-2	Trialkyl pentaborane	High energy fuel	—	—
HERCOFLEX 600	Monomeric pentaerythritol	Vinyl plasticizer	Hercules Inc.	—
Houghto-Safe 620	Water glycol base	Fire resistant hydraulic fluid	E.F. Houghton & Co.	—
Houghto-Safe 1010	Phosphate ester base	Fire resistant hydraulic fluid	E.F. Houghton & Co.	—
Houghto-Safe 1055	Phosphate ester base	Fire resistant hydraulic fluid	E.F. Houghton & Co.	—
Houghto-Safe 1120	Phosphate ester base	Fire resistant hydraulic fluid	E.F. Houghton & Co.	—
HTF	—	Experimental high temperature fuel	—	—
Hydro-Drive DIH 10	Petroleum base	General purpose hydraulic fluid (low viscosity)	E.F. Houghton & Co.	—
Hydro-Drive MIH 50	Petroleum base	General purpose hydraulic fluid (high viscosity)	E.F. Houghton & Co.	—
JP-4	Petroleum base	Jet aircraft fuel	—	Mil-J-5264 D
JP-5	Petroleum base	Jet aircraft fuel	—	Mil-J-5264 D
JP-6	Petroleum base	Jet aircraft fuel	—	Mil-F-25656
Kearsley Thinners	Xylol base	Paint thinners	Kearsley Varnish	—
Mine Fluid 3XF	—	Fire resistant hydraulic fluid	Shell Oil Co.	—
Mobilube G-90	Petroleum base	Lubricating oil, gear, Multi-purpose	Socony Mobile	Mil-L-002105A
ORONITE	Disiloxane	High temperature hydraulic fluid	Oronite Chem. Co.	Mil-H-8446 A
ORONITE 8515	85% ORONITE 8200 15% diester	High temperature hydraulic fluid	Oronite Chem. Co.	Mil-H-8446A
OS-45	Silicate ester base	High temperature hydraulic fluid	Monsanto Chem. Co.	—
OS-124	n-Bis(m-phenoxyphenoxy)	—	Monsanto Chem. Co.	—
Parapoid 10-C	Hydrocarbon containing a minimum of 30% chlorine and 6% sulfur	Oil additive	Enjay Chem. Co.	—
Pentalube TP-653	Neopentyl polyol ester	High temperature lubricant	Heyden-Newport Corp.	Mil-L-9236 A
Pydraul 60	—	Fire resistant industrial hydraulic fluid	Monsanto Chem. Co.	—
Pydraul 150	Aryl phosphate ester	Air compressor fluid	Monsanto Chem. Co.	—

**Appendix**  
**Proprietary Fluids (continued)**

Name	Composition	Description	Supplier	Pertinent Spec.
Pydraul A-200	Aryl phosphate ester	Air compressor fluid	Monsanto Chem. Co.	—
Pydraul AC	Chlorinated hydrocarbon ester	Air compressor fluid	Monsanto Chem. Co.	—
Pydraul F-9	Aryl phosphate ester	Fire resistant hydraulic fluid	Monsanto Chem. Co.	—
PYRANOL	Chlorinated aromatic hydrocarbon	Fire resistant hydraulic fluid	General Elec. Co.	—
RD-6195	Silicate ester base	Fire resistant hydraulic fluid	Monsanto Chem. Co.	—
RJ-1	Petroleum base	Ramjet fuel	—	Mil-F-25558 B
RP-1	Petroleum base	Rocket fuel	—	Mil-F-25576 B
Royco No. 808-RH	Diester base	High temperature lubricant	Royal Lubricants Co.	—
Shell Air GG-1034 WTR	—	Grease	Shell Oil Co.	Mil-G-25760
Shell F. R. Fluid	Phosphate ester Aroclor mixture	Fire resistant hydraulic fluid	Shell Oil Co.	—
Shell Iris 902	Water-in-oil emulsion	Fire resistant hydraulic fluid	Shell Oil Co.	—
Shell Tellus 33	Petroleum base	Fire resistant hydraulic fluid	Shell Oil Co.	—
SKYDROL 500A	Isooctyl diphenyl phosphate	Fire resistant hydraulic fluid	Monsanto Chem. Co.	—
Sulfole	Tertiary dodecyl mercaptan	SBR polymerization modifier	Phillips Chem. Co.	—
Suniso 3G & 4G	Petroleum base	Refrigerant oils	Sun Oil Co.	—
Supermil ASU-06752	Petroleum base	Grease	American Oil Co.	Mil-G-25760
Texaco 3450 Gear Oil	—	Rear axle oil	Texaco Inc.	—
Texamatic Fluid 1581	Petroleum base	Transmission fluid	Texaco Inc.	—
Texamatic Fluid 3401	Petroleum base	Transmission fluid	Texaco Inc.	—
Texamatic Fluid 3525	Petroleum base	Transmission fluid	Texaco Inc.	—
Texamatic Fluid 3528	Petroleum base	Transmission fluid	Texaco Inc.	—
TJ 35	Diester base	Aviation turbine lubricant	Exxon	D. Eng. DRD 2487

**Appendix**  
**Proprietary Fluids (continued)**

<b>Name</b>	<b>Composition</b>	<b>Description</b>	<b>Supplier</b>	<b>Pertinent Spec.</b>
Transmission Fluids				
ATF-1	Viscosity index 134 Saponification No. 53 Aniline point 91°C	Automatic transmission fluid	—	—
ATF-2	Viscosity index 140 Saponification No. 2.0 Aniline point 102°C	Automatic transmission fluid	—	—
ATF-3	Viscosity index 136 Saponification No. 2.0 Aniline point 100.5°C	Automatic transmission fluid	—	—
ATF-4	Viscosity index 140 Saponification No. 6.0 Aniline point 103°C	Automatic transmission fluid	—	—
ATF-5	Viscosity index 147 Saponification No. 3.3 Aniline point 98°C	Automatic transmission fluid	—	—
TREFLAN	Trifluralin	Preemergent herbicide	Elanco Products Co.	
Turbo Oil No. 10	Petroleum base	Jet aircraft lubricating oil	Exxon	—
Turbo Oil No. 65	Petroleum base	Jet aircraft lubricating oil	Exxon	—
Turbo Oil No. P-16	Petroleum base	Jet aircraft lubricating oil	Exxon	—
UCON 50-HB-280X	Water soluble polyalkylene glycol base	Heat transfer lubricant	Union Carbide Chem. Co.	—
Univis J-43	Petroleum base	Fire resistant hydraulic fluid	Exxon	Mil-H-5606
Univolt 35	Petroleum base	Oil insulating for transformers, switches and circuit breakers	Exxon	—
Versilube F-10	Silicone base	Hydraulic fluid	General Elec. Co.	—



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**For more information on Viton®  
or other elastomers:**

**(800) 853-5515 (U.S. & Canada)  
(302) 792-4000  
www.dupont-dow.com**

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**Global Headquarters**

DuPont Dow Elastomers L.L.C.  
300 Bellevue Parkway, Suite 300  
Wilmington, DE 19809 USA  
Tel. (302) 792-4000  
Fax. (302) 892-7390

**European Regional  
Headquarters**

DuPont Dow Elastomers S.A.  
2, chemin du Pavillon  
CH-1218 Le Grand-Saconnex  
Geneva, Switzerland  
Tel. +41-22-717-4000  
Fax. +41-22-717-4001

**Asia Pacific Regional  
Headquarters**

DuPont Dow Elastomers Pte Ltd.  
1 Maritime Square #10-54  
World Trade Centre  
Singapore 099253  
Tel. +65-275-9383  
Fax. +65-275-9395

**South & Central America  
Regional Headquarters**

DuPont Dow Elastomers Ltda.  
Rua Henrique Monteiro, 90  
5: andar – Pinheiros  
05423-912  
São Paulo – SP  
Brazil  
Tel. +55-11-816-0256  
Fax. +55-11-814-6845

**Viton Business Center**

DuPont Dow Elastomers L.L.C.  
P.O. Box 306  
Elkton, MD 21922-0306  
Tel. (410) 392-2500  
Fax. (410) 392-2540

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Printed in U.S.A.  
(12/98) 248331B  
Replaces: H-69132-01  
Reorder No.: H-69132-02



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