



# GLOBAL -RING AND SEAL, LLC

## Compound V90

### Fluorocarbon (FPM, FKM, VITON<sup>1</sup>)

#### Material Description

Fluorocarbon is a well-known high-performance rubber that has excellent resistance to high temperature, ozone, weather, oxygen, mineral oil, fuels, hydraulic fluids, aromatics and many organic solvents and chemicals.

#### Fluorine Content

Viton<sup>®</sup> variations include: general type (A: 66% fluorine), middle fluorine content type (B, GBL: 67 to 68.5% fluorine), high fluorine content type (F, GF: 70% fluorine), improving low temperature flexibility type (GLT, GFLT) and excellent resistance to more chemicals and solvents (Viton<sup>®</sup> ETP Extreme). We also can supply excellent acid and alkali resistance parts made by VITON<sup>®</sup> TBR.

#### Cure system: Bisphenol-cured

Standard FKM compounds are Bisphenol-cured. FKM compounds with peroxide-cured possess better acid solution resistance than the bisphenol-cured and can replace litharge-cured applied in acid solutions. In some lubricants, adding a few organic amide or amine, or choosing peroxide-cured system Viton<sup>®</sup> will be better than bisphenol curing systems.

#### Other Common Variations

- FKM can also be submitted for approval to Underwriters Laboratories (UL) for use in applications as prescribed in UL157.
- FKM has excellent resistance to high temperature, oil, solvent, flame, chemical and weather, and is usually applied in automotive, chemical processing, aerospace and many other industries.
- Viton<sup>®</sup> GLT is broadly used in thermal range of -40°C to 250°C (-40°F to 482°F) and has outstanding resistance to aggressive HTS-type oils which are commonly used in aerospace industries.
- Viton<sup>®</sup> ETP is usually applied in chemical industries.
- In some fuels, adding several methanols, Viton<sup>®</sup> F and B-type are more usable than A-type, especially F-type. If it requires lower temperature, GFLT and GBLT will be available.
- Viton<sup>®</sup> TBR 605C (TFE/propylene polymer) is better base and steam resistant than other general Viton<sup>®</sup>. It can be used in amine, amide and some bases.

#### GENERAL INFORMATION

ASTM D1418 Designation	FKM
ISO/DIN 1629 Designation	FKM
ASTM D2000/SAE J 200 Codes	HK
Standard Colors	Black
Hardness Range	50 to 90 Shore A
Relative Cost	High

#### SERVICE TEMPERATURES

Standard Low Temperature	-26°C (-15°F)
Standard High Temperature	232°C (450°F)
Special Compound Low Temperature	-40°C (-40°F)
Special Compound High Temperature	275°C (525°F)

#### PERFORMS WELL IN:

- Petroleum products
- Fuel or blend with methanol or ethanol
- Diesel or blend with biodiesel
- Mineral oil and grease
- Silicone oil and grease
- High vacuum
- Ozone, weather and very high temperature air
- Strong acid

#### DOESN'T PERFORM WELL IN:

- Ketones
- Low molecular weight organic acids (formic and acetic acids)
- Superheat steam
- Low molecular weight esters and ethers
- Phosphate ester based hydraulic fluids-Skydrol<sup>®</sup>

<sup>1</sup> Viton is a registered trademark of Dupont Dow Elastomers.

# TEST REPORT FOR COMPOUND V90

MATERIAL: FLUOROCARBON RUBBER

DUROMETER: 90

COLOR: BLACK

ASTM\* D2000 M2HK910 A1-10 B38 EF31 EO78 EO88 Z1

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SECTION OF SPEC.	PROPERTIES	REQUIREMENTS	RESULTS	ASTM TEST
	<b>ORIGINAL PHYSICAL PROPERTIES</b>			
	Hardness, Shore A	90±5	90	D2240-05
	Tensile Strength, psi (MPa)	1450 (min.)	2256 (15.56)	D412-06a
	Elongation, percent	100 (min.)	137	D412-06a
	Modulus at 100%, psi (MPa)		1656 (11.42)	D412-06a
	Specific Gravity (g/cm <sup>3</sup> )		1.837	
	<b>HEAT AGE</b>			
	<b>70 hours at 250°C (482°F)</b>			
A1-10	Hardness Change, points	+10 (max.)	+3	D573-04
	Tensile Strength Change, percent	-25 (max.)	-11	
	Elongation Change, percent	-25 (max.)	-12	
	Weight Change, percent		-1.7	
B38	<b>COMPRESSION SET</b>			D395-03, Method B
	<b>22 hours at 200°C (392°F), percent</b>	50 (plied) (max.)	20.4	
	<b>FUEL C RESISTANCE</b>			
	<b>70 hours at 23°C (73.4°F)</b>			
EF31	Hardness Change, points	±5	-1	D471-06
	Tensile Strength Change, percent	-25 (max.)	-14	
	Elongation Change, percent	-20 (max.)	-10	
	Volume Change, percent	0 to +10	+2.7	
	<b>NO. 101 OIL</b>			
	<b>70 hours at 200°C (392°F)</b>			
EO78	Hardness Change, points	-15 to +5	-8	D471-06
	Tensile Strength Change, percent	-40 (max.)	-24	
	Elongation Change, percent	-20 (max.)	-1	
	Volume Change, percent	0 to +15	+10.9	
	<b>7700/SAE OIL</b>			
	<b>70 hours at 200°C (392°F)</b>			
EO88	Hardness Change, points	-15 to +5	-11	D471-06
	Tensile Strength Change, percent	-40 (max.)	-16	
	Elongation Change, percent	-20 (max.)	-8	
	Volume Change, percent	+25 (max.)	+15.3	

\*American Society for Testing and Materials



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