

Marco Compound #L1009

90 Durometer, Black, Explosive Decompression Resistant TFE/P (Aflas®) FEPM

Technical Datasheet

General Description:

TFE/P (Aflas®) materials exhibit excellent chemical, heat and steam resistance. They provide superior performance in water, steam and virtually all caustics making them ideal for use in applications in the oil and gas exploration and extraction industry. Marco compound L1009 is specifically formulated to be Explosive Decompression (ED) resistant for use in high pressure and pressure cycling applications. Contact engineering@marcorubber.com for assistance in selecting a specialized compound when increased resistance to temperature, chemicals, or physical properties is required.

Features:

- Explosive Decompression Resistant
- Tested to NACE TN0297
- Resistant to high pressure CO₂ gas
- Ideal for prolonged exposure to steam
- Excellent resistance to fluids with high H₂S concentration
- Short-term high temperature capability up to 290° C
- High resistance to acids, amines, steam, brine, sour oil and gas (H₂S)
- Resistant to highly reactive organic and inorganic chemicals
- Excellent volume resistivity (greater than 10¹⁶Ω cm)
- Radiation resistance up to 200 MRad of gamma-ray radiation
- Withstands extended exposure to 200 °C steam
- Continuous use at 230 °C
- Resistant to highly reactive organic and inorganic chemicals

Limitations:

- Aromatic Fuels, Ketones, Carbon tetrachloride
- Chlorinated Hydrocarbons, Organic Refrigerants

Typical Applications

- High temperature pumps
- Safety valves
- Completion and production equipment

Service Temperature:

0° to 250° C (32° to 482°F)

TYPICAL PHYSICAL PROPERTIES

ORIGINAL PROPERTIES	Typical Value
Hardness, Shore A, ASTM D2240 (Z1=75+/-5)	90
Color	Black
Tensile Strength, psi, ASTM D412	2,740
Ultimate Elongation, %, ASTM D412	130
Modulus @ 50% Elongation, psi	1,950
Modulus @ 100% Elongation, psi	2,520
Compression Set @ 25% Deflection. 24 hours @ 392o F (200o C), in Air	32

This information is to the best of our knowledge accurate and reliable. However, Marco Rubber makes no warranty, expressed or implied, that parts manufactured from this material will perform satisfactorily in the customer's application. It's the customer's responsibility to evaluate parts prior to use.

ACID IMMERSION TESTING

FUMING SULPHURIC ACID – (168 hrs. @ 20°C)	Typical Test Reports
Hardness Change, Shore A	-2
Tensile Strength Retention, %	76
Ultimate Elongation Retention, %	98
Volume Change, %	+4.2

96% SULPHURIC ACID – (72 hrs. @ 100°C)	Typical Test Reports
Hardness Change, Shore A	-3
Tensile Strength Retention, %	99
Ultimate Elongation Retention, %	73
Volume Change, %	+4.4

60% NITRIC ACID – (72 hrs. @ 70°C)	Typical Test Reports
Hardness Change, Shore A	-3
Tensile Strength Retention, %	44
Ultimate Elongation Retention, %	107
Volume Change, %	+10

37% HYDROCHLORIC ACID – (72 hrs. @ 70°C)	Typical Test Reports
Hardness Change, Shore A	-2
Tensile Strength Retention, %	57
Ultimate Elongation Retention, %	112
Volume Change, %	+2.3

50% HYDROFLUORIC ACID – (168 hrs. @ 20°C)	Typical Test Reports
Hardness Change, Shore A	+6
Tensile Strength Retention, %	63
Ultimate Elongation Retention, %	117
Volume Change, %	+1.5

5% HYDROFLUORIC ACID + 25% NITRIC ACID – (168 hrs. @ 100°C)	Typical Test Reports
Hardness Change, Shore A	-6
Tensile Strength Retention, %	70
Ultimate Elongation Retention, %	84
Volume Change, %	+3.5

BASE IMMERSION TESTING

50% SODIUM HYDROXIDE – (168 hrs. @ 180°C)	Typical Test Reports
Hardness Change, Shore A	0
Tensile Strength Retention, %	96
Ultimate Elongation Retention, %	94
Volume Change, %	-0.3

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50% SODIUM HYDROXIDE – (168 hrs. @ 20°C)	Typical Test Reports
Hardness Change, Shore A	-1
Tensile Strength Retention, %	108
Ultimate Elongation Retention, %	116
Volume Change, %	+1.2

20% SODIUM HYDROXIDE – (72 hrs. @ 100°C)	Typical Test Reports
Hardness Change, Shore A	-3
Tensile Strength Retention, %	95
Ultimate Elongation Retention, %	117
Volume Change, %	+2

7% AMMONIA SOLUTION – (720 hrs. @ 140°C)	Typical Test Reports
Hardness Change, Shore A	-8
Tensile Strength Retention, %	87
Ultimate Elongation Retention, %	107
Volume Change, %	+16.1

28% AMMONIA SOLUTION – (72 hrs. @ 70°C)	Typical Test Reports
Hardness Change, Shore A	-1
Tensile Strength Retention, %	82
Ultimate Elongation Retention, %	116
Volume Change, %	+3.2

OIL IMMERSION TESTING

SHELL SPIRAX EP80 – (168 hrs. @ 175°C)	Typical Test Reports
Hardness Change, Shore A	-6
Tensile Strength Retention, %	94
Ultimate Elongation Retention, %	102
Volume Change, %	+9

SHELL SPIRAX EP80 – (72 hrs. @ 175°C)	Typical Test Reports
Hardness Change, Shore A	-6
Tensile Strength Retention, %	94
Ultimate Elongation Retention, %	102
Volume Change, %	+9

STAUFFER BLEND 7700 – (200 hrs. @ 175°C)	Typical Test Reports
Hardness Change, Shore A	-17
Tensile Strength Retention, %	83
Ultimate Elongation Retention, %	94
Volume Change, %	+27

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STAUFFER BLEND 7700 – (1000 hrs. @ 175°C)	Typical Test Reports
Hardness Change, Shore A	-14
Tensile Strength Retention, %	65
Ultimate Elongation Retention, %	85
Volume Change, %	+21

60% HEAVY OIL C – (72 hrs. @ 140°C)	Typical Test Reports
Hardness Change, Shore A	-6
Tensile Strength Retention, %	80
Ultimate Elongation Retention, %	94
Volume Change, %	+10

GENERAL IMMERSION TESTING

WATER – (72 hrs. @ 100°C)	Typical Test Reports
Hardness Change, Shore A	0
Tensile Strength Retention, %	89
Ultimate Elongation Retention, %	117
Volume Change, %	+1.1

STEAM – (168 hrs. @ 160°C)	Typical Test Reports
Hardness Change, Shore A	-3
Tensile Strength Retention, %	91
Ultimate Elongation Retention, %	84
Volume Change, %	+4.6

5% SULPHUR DIOXIDE – (48 hrs. @ 40°C)	Typical Test Reports
Hardness Change, Shore A	-4
Tensile Strength Retention, %	69
Ultimate Elongation Retention, %	84
Volume Change, %	+7.8

TRIETHYLENE GLYCOL – (264 hrs. @ 230°C)	Typical Test Reports
Hardness Change, Shore A	-5
Tensile Strength Retention, %	88
Ultimate Elongation Retention, %	148
Volume Change, %	+7.7

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