



**Marco Compound # E1038**  
**80 Durometer, Black, NAS 1633 Rev 5 EPDM**  
**Technical Datasheet**

**Common Names:**

Ethylene-Propylene (EP, EPDM)

**General Description:**

EPDM rubber (ethylene propylene diene monomer rubber) is an elastomer which is characterized by wide range of applications and good chemical resistance.

**Features:**

- Meets NAS 1633 Revision 5
- Good heat and compression resistance.
- Resistant to ketones, hot and cold water, steam, alkalis, polar solvents, ozone, sunlight, alcohols, glycol engine coolant and Skydrol (phosphate ester hydraulic fluid).

**Limitations:**

- Not recommended for oils, gasoline, kerosene, aromatic and aliphatic hydrocarbon, halogenated solvents, concentrated acids, non-polar solvents, petroleum oils and aromatic fuels.

**Service Temperature:**

-65 to 300° F (-54 to 150° C)

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Specification: NAS 1613 Revision 5

All testing done on AS568-214 size O-rings unless otherwise noted

Original Properties	Specifications	Test Results
Hardness, Shore M, ASTM D2240	80 ± 5	83
Tensile Strength, psi, ASTM D1414	1400 min.	2775
Ultimate Elongation, %, ASTM D1414	125 min.	151
Modulus at 100% Elongation, psi, ASTM D1414	800 min.	1378
Specific Gravity, ASTM D297	As determined	1.20
High Temperature Air Oven Age, ASTM D573, 70 hrs. at 300°F		
Hardness change, Shore M, ASTM D2240	+10 max.	+3
% Tensile Strength change, ASTM D412 Die C	-25 max.	+7.4
% Elongation change, ASTM D412 Die C	-10 max.	-1.7
Low Temperature Retraction, ASTM D1329, 75% Strain		
As Received, TR-10	-50 or colder	-67
TR-70	-18 or colder	-22
Fluid Soaked in Skydrol 500 B-4 for 70 hrs. at 160°F, TR-10, °F	-52 or colder	-62
Fluid Soaked in Skydrol 500 B-4 for 70 hrs. at 160°F, TR-70, °F	-3 or colder	-15
Fluid Soaked in Chevron HyJet IV-A+ for 70 hrs. at 160°F, TR-10, °F	-52 or colder	-58
Fluid Soaked in Chevron HyJet IV-A+ for 70 hrs. at 160°F, TR-70, °F	-3 or colder	-18
Fluid Soaked in Skydrol 5 for 70 hrs. at 160°F, TR-10, °F	-52 or colder	-59
Fluid Soaked in Skydrol 5 for 70 hrs. at 160°F, TR-70, °F	-3 or colder	-19
Compression Set, ASTM D395 Method B and ASTM D1414, AS568-330 size O-rings		
% Permanent Set, 22 hrs. at 250°F	30 max.	4.4
% Permanent Set, Immersed in Skydrol 500 B-4, 22 hrs. at 250°F	20 max.	0.8
% Permanent Set, Immersed in Chevron HyJet IV-A+, 22 hrs. at 250°F	20 max.	<0
% Permanent Set, Immersed in Skydrol 5, 22 hrs. at 250°F	20 max.	<0
% Permanent Set, Immersed in Skydrol 500 B-4, 70 hrs. at 160°F	20 max.	0.8
% Permanent Set, Immersed in Chevron HyJet IV-A+, 70 hrs. at 160°F	20 max.	0
% Permanent Set, Immersed in Skydrol 5, 22 hrs. at 160°F	20 max.	<0
Immersion in Skydrol 500 B-4, 22 hrs. at 250°F, ASTM D471		
Hardness change, Shore M, ASTM D2240	-10 max.	-1
Tensile Strength, psi, ASTM D1414	1350 min.	2532
Ultimate Elongation, %, ASTM D1414	125 min.	159
Modulus at 100% Elongation, psi, ASTM D1414	500 min.	1148
% Volume change, ASTM D471	0 to +18	+5.2

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Immersion in Chevron HyJet IV-A+, 22 hrs. at 250°F, ASTM D471	Specification	E454
Hardness change, Shore M, ASTM D2240	-10 max.	-2
Tensile Strength, psi, ASTM D1414	1350 min.	2460
Ultimate Elongation, %, ASTM D1414	125 min.	166
Modulus at 100% Elongation, psi, ASTM D1414	500 min.	1214
% Volume change, ASTM D471	0 to +18	+8.6
Immersion in Skydrol 5, 22 hrs. at 250°F, ASTM D471		
Hardness change, Shore M, ASTM D2240	-10 max.	-2
Tensile Strength, psi, ASTM D1414	1350 min.	2470
Ultimate Elongation, %, ASTM D1414	125 min.	167
Modulus at 100% Elongation, psi, ASTM D1414	500 min.	1181
% Volume change, ASTM D471	0 to +18	+9.6
Immersion in Skydrol 500 B-4, 70 hrs. at 250°F, ASTM D471		
Hardness change, Shore M, ASTM D2240	-12 max.	-3
Tensile Strength, psi, ASTM D1414	1300 min.	2635
Ultimate Elongation, %, ASTM D1414	125 min.	148
Modulus at 100% Elongation, psi, ASTM D1414	500 min.	1017
% Volume change, ASTM D471	0 to +18	+7.0
Immersion in Chevron HyJet IV-A+, 70 hrs. at 250°F, ASTM D471		
Hardness change, Shore M, ASTM D2240	-12 max.	-5
Tensile Strength, psi, ASTM D1414	1300 min.	2765
Ultimate Elongation, %, ASTM D1414	125 min.	161
Modulus at 100% Elongation, psi, ASTM D1414	500 min.	886
% Volume change, ASTM D471	0 to +18	+13.1
Immersion in Skydrol 5, 70 hrs. at 250°F, ASTM D471		
Hardness change, Shore M, ASTM D2240	-12 max.	-5
Tensile Strength, psi, ASTM D1414	1300 min.	2496
Ultimate Elongation, %, ASTM D1414	125 min.	148
Modulus at 100% Elongation, psi, ASTM D1414	500 min.	1155
% Volume change, ASTM D471	0 to +18	+14.8
Immersion in Skydrol 500 B-4, 334 hrs. at 225°F, ASTM D471		
Tensile Strength, psi, ASTM D1414	1200 min.	2473
Ultimate Elongation, %, ASTM D1414	125 min.	148
Modulus at 100% Elongation, psi, ASTM D1414	500 min.	1096
% Volume change, ASTM D471	0 to +18	+6.5
Immersion in Chevron HyJet IV-A+, 334 hrs. at 225°F, ASTM D471		
Tensile Strength, psi, ASTM D1414	1200 min.	2271
Ultimate Elongation, %, ASTM D1414	125 min.	161
Modulus at 100% Elongation, psi, ASTM D1414	500 min.	1164
% Volume change, ASTM D471	0 to +18	+13.4
Immersion in Skydrol 5, 334 hrs. at 225°F, ASTM D471		
Tensile Strength, psi, ASTM D1414	1200 min.	2568
Ultimate Elongation, %, ASTM D1414	125 min.	141
Modulus at 100% Elongation, psi, ASTM D1414	500 min.	1131
% Volume change, ASTM D471	0 to +18	+15.7

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Immersion in Skydrol 500 B-4, 672 hrs. at 225°F, ASTM D471	Specification	E454
Hardness change, Shore M, ASTM D2240	-15 max.	-3
% Volume change, ASTM D471	0 to +18	+7.8
Immersion in Chevron HyJet IV-A+, 672 hrs. at 225°F, ASTM D471		
Hardness change, Shore M, ASTM D2240	-15 max.	-4
% Volume change, ASTM D471	0 to +18	+15.8
Immersion in Skydrol 5, 672 hrs. at 225°F, ASTM D471		
Hardness change, Shore M, ASTM D2240	-15 max.	-5
% Volume change, ASTM D471	0 to +18	+16.6
Immersion in Skydrol 500 B-4, 1000 hrs. at 225°F, ASTM D471		
Hardness change, Shore M, ASTM D2240	-15 max.	-3
% Volume change, ASTM D471	0 to +18	+8.8
Immersion in Chevron HyJet IV-A+, 1000 hrs. at 225°F, ASTM D471		
Hardness change, Shore M, ASTM D2240	-15 max.	-5
% Volume change, ASTM D471	0 to +18	+15.9
Immersion in Skydrol 5, 1000 hrs. at 225°F, ASTM D471		
Hardness change, Shore M, ASTM D2240	-15 max.	-5
% Volume change, ASTM D471	0 to +18	+16.6
Immersion in Skydrol 500 B-4, 1440 hrs. at 225°F, ASTM D471		
Hardness change, Shore M, ASTM D2240	-15 max.	-4
% Volume change, ASTM D471	0 to +18	+7.6
Immersion in Chevron HyJet IV-A+, 1440 hrs. at 225°F, ASTM D471		
Hardness change, Shore M, ASTM D2240	-15 max.	-6
% Volume change, ASTM D471	0 to +18	+13.9
Immersion in Skydrol 5, 1440 hrs. at 225°F, ASTM D471		
Hardness change, Shore M, ASTM D2240	-15 max.	-5
% Volume change, ASTM D471	0 to +18	+17.3
Immersion in Skydrol 500 B-4, 70 hrs. at 160°F, ASTM D471		
Hardness change, Shore M, ASTM D2240	-5 max.	-1
% Volume change, ASTM D471	0 to +8	+2.5
Immersion in Chevron HyJet IV-A+, 70 hrs. at 160°F, ASTM D471		
Hardness change, Shore M, ASTM D2240	-5 max.	-3
% Volume change, ASTM D471	0 to +8	+7.9
Immersion in Skydrol 5, 70 hrs. at 160°F, ASTM D471		
Hardness change, Shore M, ASTM D2240	-5 max.	-2
% Volume change, ASTM D471	0 to +8	+7.2
AS568-120 Size O-rings, Fluid Immersions per ASTM D471, times, temperatures and fluids as noted		
% Volume change, 22 hrs. at 250°F in Skydrol 500 B-4	0 to +18	+8.6
% Volume change, 22 hrs. at 250°F in Chevron HyJet IV-A+	0 to +18	+14.2
% Volume change, 22 hrs. at 250°F in Skydrol 5	0 to +18	+15.9
% Volume change, 70 hrs. at 160°F in Skydrol 500 B-4	0 to +10	+4.2
% Volume change, 70 hrs. at 160°F in Chevron HyJet IV-A+	0 to +10	+9.9
% Volume change, 70 hrs. at 160°F in Skydrol 5	0 to +10	+10.0

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Corrosion and Adhesion, 92% Relative Humidity, 96 hrs. at 68°F, AS568-214 O-rings, dry rings	Specification	E454
Aluminum alloy per AMS-QQ-A-250/4	No corrosion or adhesion	Pass
Brass per ASTM B 36/B 36M	No corrosion or adhesion	Pass
Phosphor Bronze per ASTM B139	No corrosion or adhesion	Pass
Steel per AMS 6345	No corrosion or adhesion	Pass
Aluminum Bronze per ASTM B150	No corrosion or adhesion	Pass
Corrosion and Adhesion, 92% Relative Humidity, 96 hrs. at 68°F, AS568-214 O-rings, Immersed in Skydrol 500 B-4 and drained prior to humidity test		
Aluminum alloy per AMS-QQ-A-250/4	No corrosion or adhesion	Pass
Brass per ASTM B 36/B 36M	No corrosion or adhesion	Pass
Phosphor Bronze per ASTM B139	No corrosion or adhesion	Pass
Steel per AMS 6345	No corrosion or adhesion	Pass
Aluminum Bronze per ASTM B150	No corrosion or adhesion	Pass
Corrosion and Adhesion, 92% Relative Humidity, 96 hrs. at 68°F, AS568-214 O-rings, Immersed in Chevron HyJet IV-A+ and drained prior to humidity test		
Aluminum alloy per AMS-QQ-A-250/4	No corrosion or adhesion	Pass
Brass per ASTM B 36/B 36M	No corrosion or adhesion	Pass
Phosphor Bronze per ASTM B139	No corrosion or adhesion	Pass
Steel per AMS 6345	No corrosion or adhesion	Pass
Aluminum Bronze per ASTM B150	No corrosion or adhesion	Pass
Corrosion and Adhesion, 92% Relative Humidity, 96 hrs. at 68°F, AS568-214 O-rings, Immersed in Skydrol 5 and drained prior to humidity test		
Aluminum alloy per AMS-QQ-A-250/4	No corrosion or adhesion	Pass
Brass per ASTM B 36/B 36M	No corrosion or adhesion	Pass
Phosphor Bronze per ASTM B139	No corrosion or adhesion	Pass
Steel per AMS 6345	No corrosion or adhesion	Pass
Aluminum Bronze per ASTM B150	No corrosion or adhesion	Pass
Dynamic Endurance Tests per NAS-1613 Rev. 5 - Testing conducted at Boeing Laboratories		
Tested in Skydrol 500 B-4, Cold cycle at -65°F	<1 cc per gland	0
Tested in Skydrol 500 B-4, 70,000 cycles at 160°F	<1 cc per gland	0
Tested in Skydrol 500 B-4, 90,000 cycles at 225°F	<1 cc per gland	0
Tested in Skydrol 500 B-4, Cold cycle at -65°F	<1 cc per gland	0
Tested in Chevron HyJet IV-A+, Cold cycle at -65°F	<1 cc per gland	0
Tested in Chevron HyJet IV-A+, 70,000 cycles at 160°F	<1 cc per gland	0
Tested in Chevron HyJet IV-A+, 90,000 cycles at 225°F	<1 cc per gland	0
Tested in Chevron HyJet IV-A+, Cold cycle at -65°F	<1 cc per gland	0
Tested in Skydrol 5, Cold cycle at -65°F	<1 cc per gland	0
Tested in Skydrol 5, 70,000 cycles at 160°F	<1 cc per gland	0
Tested in Skydrol 5, 90,000 cycles at 225°F	<1 cc per gland	0
Tested in Skydrol 5, Cold cycle at -65°F	<1 cc per gland	0

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