Compound E70

Ethylene Propylene Rubber (EPR, EPDM)
Material Description

Ethylene Propylene Rubber (EPDM) is a Copolymer of ethylene and propylene. Furthermore, it is a terpolymer of ethylene and propylene with a small amount of a third monomer (usually a diolefin) to permit vulcanization with sulfur. Generally, EPDM possesses an excellent resistance to ozone, sunlight and weathering, and has very good flexibility at low temperature, good chemical resistance (many dilute acids and alkalis as well as polar solvents) and good electrical insulation property.

GENERAL INFORMATION	
ASTM D1418 Designation	EPM, EPDM
ISO/DIN 1629 Designation	EPM, EPDM
ASTM D2000/ SAE J 200 Codes	AA, BA, CA, DA
Standard Color	Black
Hardness Range	30 to 90 Shore A
Relative Cost	Low

Cure system: Peroxide-cured

Standard EPDMs are usually sulfur-cured. Sulfur-cured compounds offer better flexible properties but are more prone to hardening and have an inferior compression set with high temperature. Peroxide-cured EPDMs have better heat resistance and a lower compression set. It complies with long-time usage, especially for hose systems in the construction industry, but is more expensive and more difficult for production than the sulfur-cured EPDMs.

Other Common Variations

- EPDMs often are internally lubricated to improve ease of installation or reduce friction for dynamic applications.
- EPDMs can be formulated with only “white list” ingredients, as specified in 21.CFR 177.2600, for use in applications where the elastomer will be in contact with food or beverages.
- EPDMs can be submitted for approval by the National Sanitation Foundation (NSF) for use in drinking water applications.
- EPDMs are usually used in automotive air conditioning systems where there is use of R134a refrigerant gas and POE or PAG lubricant and new refrigerant for environment protection R744. R744 air conditioning systems require excellent resistance to explosive decompression in hydrogen dioxide at high pressure and high temperature.
- EPDMs are usually used in phosphate ester type hydraulic fluids.

SERVICE TEMPERATURES	
Standard Low Temperature	-55°C (-67°F)
Standard High Temperature	125°C (257°F)
Special Low Temperature	-55°C (-67°F)
Special High Temperature	150°C (302°F)

PERFORMS WELL IN:
• Alcohols
• Automotive brake fluid
• Ketones
• Dilute acids and alkalis
• Silicone oils and greases
• Steam up to 204.4°C (400°F)
• Water
• Phosphate ester based hydraulic fluids-Skydrol®
• Ozone, aging and weathering

DOESN’T PERFORM WELL IN:
• Aliphatic and aromatic hydrocarbons
• Di-ester based lubricants
• Halogenated solvents
• Petroleum based oils and greases

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TEST REPORT FOR COMPOUND E70

MATERIAL: ETHYLENE PROPYLENE
DUROMETER: 70
COLOR: BLACK
ASTM* D2000 M4CA714 A25 B44 EA14 F17 Z1 Z2

E 70

SECTION OF	PROPERTIES	REQUIREMENTS	RESULTS	ASTM TEST
	ORIGINAL PHYSICAL PROPERTIES			
	Hardness, Shore A	70±5	75	D2240-05
	Tensile Strength, psi (MPa)	2031 (min.)	2429 (16.75)	D412-06a
	Elongation, percent	200 (min.)	259	D412-06a
	Modulus at 100%, psi (MPa)		753 (5.19)	D412-06a
	Specific Gravity (g/cm³)		1.144	
A25	**HEAT AGE**			D573-04
	70 hours at 125°C (257°F)			
	Hardness Change, points	+10 (max.)	+4	
	Tensile Strength Change, percent	-20 (max.)	-7	
	Elongation Change, percent	-40 (max.)	-6	
	Weight Change, percent		-2.9	
B44	**COMPRESSION SET**			D395-03, Method B
	70 hours at 100°C (212°F), percent	50 (plied) (max.)	8.5	
EA14	**WATER RESISTANCE**			D471-06
	70 hours at 100°C (212°F)			
	Hardness Change, points		-3	
	Tensile Strength Change, percent		-13	
	Elongation Change, percent		+2	
	Volume Change, percent	±5	+4.1	
F17	**LOW-TEMPERATURE BRITTLENESS POINT**			D2137-05, Method A
	3 minutes at -40°C (-40°F)			
	Sample type: T-50			
	Coolant : Methanol			
	Brittleness temperature to nearest 1°C (1°F)	No crack	Pass	

*American Society for Testing and Materials

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