POLYURETHANE O-RING OVERVIEW

MATERIAL: Polyurethane Rubber (PU, AU, EU)

MATERIAL DESCRIPTION

The millable Polyurethane (PU) rubbers are distinguished into two types; the first is polyester urethane (AU) and the other is polyether urethane (EU). AU type urethanes have outstanding oil, fuel and solvent resistance but can be attacked by hydrolysis. EU type urethanes are not attacked by hydrolysis and still offer a fuel and oil resistance comparable to low ACN (18 to 22% ACN) Nitriles or HNBRs. Any type polyurethane has excellent wear resistance, high tensile strength and high elasticity in comparison with any other elastomers. We can also offer any type thermoplastic urethane (TPU).

CURE SYSTEM: PEROXIDE-CURED

Standard PU compounds are peroxide-cured.

OTHER COMMON VARIATIONS

- Polyurethane usually is applied in the mechanical industry, especially in places where material must have higher wear resistance and strength.
- In some applying environments, moisture condensing will happen on the surface of the rubber seal; this will cause hydrolysis of AU so choosing EU is better in these cases. However, EU does not resist oil very well, thus higher aniline point oil must be used for lubricant application.
- TPU will be better than millable polyurethane when applied in hydraulic systems.

GENERAL INFORMATION

ASTM D1418 DESIGNATION	AU, EU	**STANDARD COLOR**	Transparent
ISO/DIN 1629 DESIGNATION	AU, EU	**HARDNESS RANGE**	60 to 93 Shore A
ASTM D2000/ SAE J 200 CODES	BG	**RELATIVE COST**	Medium to High

SERVICE TEMPERATURES

STANDARD LOW TEMPERATURE	-40°F -40°C	**SPECIAL COMPOUND LOW TEMPERATURE**	-67°F -55°C
STANDARD LOW TEMPERATURE	176°F 80°C	**SPECIAL COMPOUND HIGH TEMPERATURE**	212°F 100°C

PERFORMS WELL IN

- Aliphatic hydrocarbon
- Mineral oil and grease
- Silicone oil and grease
- Ozone
- Water up to 50°C (122°F) EU type

DOESN'T PERFORM WELL IN

- Ketones
- Alcohols
- Esters
- Ethers
- Hot water and steam
- Alkalis, amines
- Acids
- Glycols

* RAGCO supports the autonomy of its locations to select the best products to service their markets. Subtle variations of these specification may exist. Contact your RAGCO affiliate for confirmation.

POLYURETHANE-70 O-RING

TEST REPORT FOR COMPOUND U70

DUROMETER: 70 **COLOR: TRANSPARENT**

ASTM* D2000, M3BG714, B14, EA14, EO14, Z1, Z2

SECTION OF SPEC.	PROPERTIES	REQUIREMENTS	RESULTS	ASTM TEST METHOD
	ORIGINAL PHYSICAL PROPERTIES			
	Hardness, Shore A	70 ± 5	69	D2240-05
	Tensile Strength	2031 PSI (min)	2922 PSI (20.15 MPa)	D412-06a
	Elongation	250% (min)	458%	D412-06a
	Modulus at 100%		310 PSI (2.14 MPa)	D412-06a
	Specific Gravity		1.147 g/cm^3	
B14	**COMPRESSION SET: 22 hours at 100°C (212°F)**	50% (button) (max)	45.6%	D395-03, Method B
	WATER RESISTANCE: 70 hours at 100°C (212°F)			
	Hardness Change	± 10 points	-5 points	
EA14	Tensile Strength Change		-27%	D471-06
	Elongation Change		-16%	
	Volume Change	± 15%	+5%	
	NO. 1 OIL RESISTANCE: 70 hours at 100°C (212°F)			
	Hardness Change	-7 to +5 points	-4 points	
EO14	Tensile Strength Change	-20% (max)	-6%	D471-06
	Elongation Change	-40% (max)	-8%	
	Volume Change	-5% to +10%	+6.4%	
	NO. 3 OIL RESISTANCE: 70 hours at 100°C (212°F)			
	Hardness Change		-30 points	
Z2	Tensile Strength Change		-46%	D471-06
	Elongation Change		-32%	
	Volume Change		+56.1%	

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POLYURETHANE-90 O-RING

TEST REPORT FOR COMPOUND U90 DUROMETER: 90 COLOR: TRANSPARENT

ASTM* D2000, M3BG910, A14, B14, EA14, EO14, Z1, Z2, Z3

SECTION OF SPEC.	PROPERTIES	REQUIREMENTS	RESULTS	ASTM TEST METHOD
	ORIGINAL PHYSICAL PROPERTIES			
	Hardness, Shore A	90 ± 5	91	D2240-04
	Tensile Strength	1450 PSI (min)	2847 PSI (19.63 MPa)	D412-98a
	Elongation	100% (min)	180%	D412-98a
	Modulus at 100%		1659 PSI (11.44 MPa)	D412-98a
	Specific Gravity		1.231 g/cm^3	
	HEAT AGE: 70 hours at 100°C (212°F)			
	Hardness Change	± 15 points	0 points	
A14	Tensile Strength Change	-20% (max)	-15%	D573-04
	Elongation Change	-40% (max)	-18%	
	Weight Change		+0.1%	
B14	**COMPRESSION SET: 22 hours at 100°C (212°F)**	50% (button) (max)	29.5%	D395-03, Method B
	WATER RESISTANCE: 70 hours at 100°C (212°F)			
	Hardness Change	± 10 points	-1 points	
EA14	Tensile Strength Change		-1%	D471-98
	Elongation Change		+8%	
	Volume Change	± 15%	+3.9%	
	NO. 1 OIL RESISTANCE: 70 hours at 100°C (212°F)			
	Hardness Change	-7 to +5 points	-2 points	
EO14	Tensile Strength Change	-20% (max)	-17%	D471-98
	Elongation Change	-40% (max)	-16%	
	Volume Change	-5% to +10%	+4.8%	
Z3	**TENSILE SET: Hold 100% Elongation for 2 minutes, Release tension and rest 2 minutes**		10.2%	

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