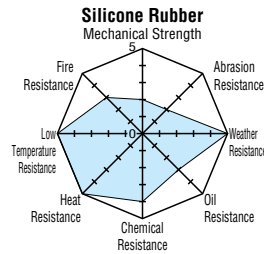
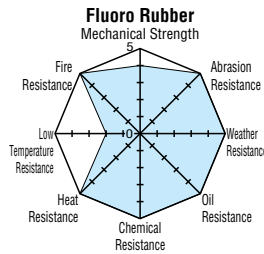
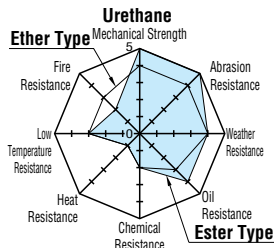


Properties and Characteristics of Urethanes & Rubbers

Property Comparison Chart



Attributes

Item	Unit	Urethane			Fluoro Rubber	Silicone Rubber	
Specific Gravity	-	1.13	1.20	1.15	1.8	0.98	0.95
Hardness	Shore A	90	70	50	80	70	50
Tensile Strength	MPa	44.6	31.3	27.4	12.5	7.4	8.8
Elongation	%	530	650	690	330	300	330
Max. Operating Temp.	°F (°C)	158 (70)	158 (70)	158 (70)	446 (230)	392 (200)	392 (200)
Min. Operating Temp.	°F (°C)	-4 (-20)	-4 (-20)	-4 (-20)	14 (-10)	-94 (-70)	-94 (-70)

⚠ The characteristic values of tensile strength and elongation are tested based on the JIS * standard K6251. * JIS is Japanese Industrial Standards.

Features

Materials	Advantages	Disadvantages
Urethane	Excels in abrasion resistance and mechanical strength.	Low heat and chemical resistance.
Fluoro Rubber	Excels in heat resistance, oil resistance, weather resistance, wear resistance, and chemical resistance.	Cost
Silicone Rubber	Excels in low temperature resistance and heat resistance. Excels in weather resistance.	Low mechanical strength.

Urethane (Ether Type, Ester Type) Property Comparison

Characteristics	Ether Type (Shore A90)	Ester Type (Shore A70/50)
Tensile Strength		○
Elongation		○
Tensile Breakage Strength		○
Impact Resilience	○	
Abrasion Resistance	Slip Wear	○
	Shock Wear	○
Hydrolysis Resistance	○	
Oil resistance		○
Strength		○
Durability		○
Acid Resistance, Alkaline Resistance	○	

Property Order

Item	Weak	—	—	Strong
Mechanical Strength	Silicone		Fluorine	Urethane
Weather Resistance		Urethane	Silicone	Fluorine
Abrasion Resistance	Silicone		Urethane	Fluorine
Heat Resistance		Urethane		Silicone Fluorine
Oil Resistance		Silicone	Urethane	Fluorine

The Criteria of Urethane Shore Hardness

- Select the Shore A90, Shore A70 and Shore A50 based on the hardness of a hardball (using baseball), a softball and a plastic eraser, respectively.
- Shore A90 — Shore A70 — Shore A50 is the order of increasing softness.

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