



## Rubber Material General Selection Guide

This information is meant as a general guide and indication of the suitability of various elastomers in use today for service in these chemicals and fluids. The ratings are based, for the most part, on published literature of various polymer suppliers and rubber manufacturers. We cannot guarantee their accuracy nor assume responsibility for use thereof. Several factors must always be considered in using a rubber part in service. The most important are:

1. *The Temperature of Service:* Higher temperatures increase the effect of all chemicals on polymers. The increase varies with the polymer and the chemical. A compound quite suitable at room temperature might fail miserably at elevated temperature.
2. *Conditions of Service:* A compound that swells badly might still function well as a static seal, yet fail in any dynamic application.
3. *The Grade of the Polymer:* Many types of polymers are available in different grades that vary greatly in chemical resistance.
4. *The Compound Itself:* Compounds designed for other outstanding properties may be poorer in performance than one designed especially for fluid resistance.

**In light of the above factors, it is always best to test. If you have any questions, please give us a call. We will be glad to help with your selection!**

| Materials and Typical Properties | Natural rubber | SBR    | Butyl   | EPDM      | Neoprene | Nitrile   | Polyurethane | Silicone | Acrylic | Epichlorohydrin | Flourelastomer |
|----------------------------------|----------------|--------|---------|-----------|----------|-----------|--------------|----------|---------|-----------------|----------------|
| <b>Basic Properties</b>          |                |        |         |           |          |           |              |          |         |                 |                |
| Hardness (Shore A)               | 30-100         | 40-100 | 30-90   | 30-90     | 40-95    | 30-90     | 55-100       | 25-80    | 40-90   | 40-90           | 55-90          |
| Max tensile strength (psi)       | 4000           | 2500   | 2000+   | 2000-3000 | 3000+    | 1000-3500 | 4000-8000    | 600-1500 | 1700+   | 2500            | 1500-3000      |
| Max elongation (%)               | 500            | 450+   | 300-800 | 500       | 650-850  | 400-600   | 250-800      | 90-800   | 450     | 400             | 100-450        |
| Specific Gravity                 | 0.93           | 0.94   | 0.92    | 0.86      | 1.23     | 1.00      | 1.05         | 0.95     | 1.10    | 1.27 - 1.36     | 1.40 - 1.95    |
| Average Cost per #               | \$2.40         | \$1.75 | \$2.60  | \$2.00    | \$3.30   | \$2.80    | \$5.75       | \$6.00   | \$6.00  | \$4.00          | \$18.00+       |
| Resilience / Rebound             | O              | O      | F       | G-E       | E        | F-G       | G-E          | P-E      | G       | F-G             | G              |
| Compression set                  | G              | F-G    | F-G     | G-E       | F-G      | G         | E            | G-E      | F-G     | F               | G-E            |
| Electric Resistance              | E              | E      | E       | E         | G        | P-F       | G            | E        | F       |                 | G              |
| Gas Permeability                 | G              | G      | O       | G         | G        | G         | G            | P-F      | G       | E               | E              |

O=outstanding, E=excellent, G=good, F=fair, P=poor

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|---|----------------|-----|-------|------|----------|---------|--------------|----------|---------|-----------------|----------------|
| <b>Mechanical Resistance Properties</b>                 |                |     |       |      |          |         |              |          |         |                 |                |
| Flex Cracking   | F              | G   | G     | G    | G        | F       | G-E          | F-E      | F       | G               | G              |
| Impact  | E              | E   | G     | G    | G        | F       | E            | P-F      | P       | G               | P-G            |
| Abrasion  | E              | E   | F     | G    | E        | E       | E            | P-G      | F-G     | F-G             | G              |
| Tear  | E              | F-G | G     | F    | G        | G       | E            | P-G      | F       | F-G             | F-G            |
| Cut Growth  | E              | G   | E     | G    | G        | G       | F-E          | P-G      | G       | G               | F-G            |
| <b>Temperature Resistance Properties</b>                |                |     |       |      |          |         |              |          |         |                 |                |
| Heat Aging at 212 F                                     | F              | G   | G     | E    | G-E      | G       | G            | E        | E       | G-E             | O              |
| Flame Resistance  | P              | P   | P     | P    | G        | P-F     | P-F          | F-G      | P-F     | F-G             | E              |
| Low Temp. Flexibility                                   | G-E            | G   | F-G   | G-E  | F        | F-G     | G            | E        | P-F     | F-E             | F-G            |
| <b>Chemical and Environmental Resistance Properties</b> |                |     |       |      |          |         |              |          |         |                 |                |
| Weather   | F              | P-F | G-E   | E    | E        | F       | E            | E        | E       | G-E             | E              |
| Sunlight  | P-F            | F   | E     | E    | G-E      | P-F     | G-E          | E        | E       | G-E             | E              |
| Oxidation   | G              | F   | E     | E    | E        | F-G     | G            | E        | E       | G-E             | O              |
| Ozone   | P              | P   | E     | E    | E        | P       | E            | E        | G       | E               | E              |
| Radiation   | F-G            | G   | P     | F-G  | G        | F-G     | G            | F-E      | P-G     | -               | F-G            |
| Water   | E              | E   | E     | E    | G        | E       | P-G          | G        | F       | G               | G              |
| Oil and Gas   | P              | P   | P     | P    | F-G      | G-E     | G-E          | P-F      | G       | G-E             | E              |
| Animal & Vegetable Oils                                 | F              | F   | G-E   | G    | G        | G-E     | G            | F-G      | G-E     | G-E             | E              |
| Acids   | F-G            | F-G | E     | E    | G-E      | G       | P-F          | P-G      | F       | P-F             | G-E            |
| Alkalies  | F-G            | F-G | E     | E    | G-E      | G       | P-F          | P-F      | F       | F-G             | P-G            |
| Aliphatic Hydrocarbons <sup>1</sup>                     | P              | P   | P     | P    | G        | E       | G            | P-F      | E       | G-E             | E              |
| Aromatic Hydrocarbons <sup>2</sup>                      | P              | P   | P-F   | P-F  | F        | G       | F            | P        | F       | G               | E              |
| Halogenated Hydrocarbons <sup>3</sup>                   | P              | P   | P     | P    | P        | F-G     | F-G          | P-G      | P       | P-F             | G              |
| Alcohol   | G              | F-G | G-E   | G    | G        | G       | G            | G        | P-G     | G               | E              |
| <b>Other Properties</b>                                 |                |     |       |      |          |         |              |          |         |                 |                |
| Taste   | F-G            | F-G | F-G   | G    | F-G      | F       | G            | G        | F-G     | F               | F-G            |
| Odor  | F-G            | G   | G     | G    | F-G      | G       | G            | G        | F-G     | F-G             | G              |
| Nonstaining   | P-G            | P-G | G     | G    | G-E      | F       | G            | E        | E       | F               | P-G            |
| Bonding to rigid materials                              | E              | E   | F-E   | P-F  | E        | F-G     | F-G          | F-G      | G       | F-G             | P-G            |

<sup>1</sup>=gasoline, kerosene, <sup>2</sup>=benzol, toluol, <sup>3</sup>=degreaser solvents

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