



## Polymer & Material Selection Guide

### CM – Chloropolyethylene Rubber

**Hardness Range**

40 to 90 Durometer Shore A

**Temperature Range**

-60° F to +300° F

**Advantages** in performance:

- for abrasion resistance and compression set.
- in certain acids, alcohol's, alkalis, and LP gases & fuel oils.
- for coloring capabilities, low gas permeation, ozone resistance, oxidation resistance, radiation resistance, sunlight resistance, weather resistance, and water resistance.

**Limitations** in performance:

- for tear resistance.
- in organic acids, aldehydes, amines, brake fluids, selected aromatic fuels, solvents, hydrocarbons, and refrigerants.
- for steam resistance.

### CSM – Chlorosulfonated – Polyethylene Rubber, Hypalon® Rubber

**Hardness Range**

45 to 95 Durometer Shore A

**Temperature Range**

-60° F to +275° F

**Advantages** in performance:

- for abrasion resistance, for adhesion to metal and rigid materials.
- in various acids, alcohol's, alkalis, and silicone oil.
- for coloring capability, flame resistance, gas permeability, ozone resistance, oxidation resistance, sunlight resistance, and weather resistance.

**Limitations** in performance:

- for compression set.
- in aldehydes, amines, diester oils, selected esters, ethers, halogenated solvents, hydrocarbons, ketones, lacquer solvents, and petroleum aromatics.
- for radiation resistance, and steam resistance.

Hypalon® is a registered trademark of the DuPont Corporation.



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### ECO – Epichlorohydrin Rubber, Hydrin® Rubber

Hardness Range	40 to 90 Durometer Shore A
Temperature Range	-60° F to +275° F

#### Advantages in performance:

- for adhesion to rigid materials, compression set, impact resistance, and tear resistance.
- in animal & vegetable oils, selected aliphatic & aromatic hydrocarbon fuels, halogenated solvents, LP gases & fuel oils mineral oils refrigerant halofluorocarbons, and silicone oils.
- for low gas permeability, ozone resistance, and oxidation resistance.

#### Limitations in performance:

- for selected acids, aldehydes, alkalis, amines, brake fluids, diester oils, esters, halogenated solvents, certain non-aromatic petroleum, and refrigerant ammonia.
- for flame resistance, and radiation resistance.

Hydrin® is a registered trademark of the DuPont Corporation.

### EA – Ethylene Acrylic Rubber, Vamac® Rubber

Hardness Range	35 to 95 Durometer Shore A
Temperature Range	-55° F to +350° F

#### Advantages in performance:

- for abrasion resistance and tear resistance.
- in organic acids, alcohol's, alkalis, and silicone oil.
- for low gas permeability, ozone resistance, oxidation resistance, sunlight resistance, weather resistance, and water resistance.

#### Limitations in performance:

- for resilience & rebound.
- in selected acids, concentrated alkalis, brake fluids, diester oils, esters & ethers, aromatic hydrocarbon fuel, halogenated solvents, ketones, lacquer solvents, LP gases & fuel oils, mineral oils, refrigerant ammonia, and refrigerant halofluorocarbons with & without oils.

Vamac® is a registered trademark of the DuPont Corporation.

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### EP – Ethylene Propylene Rubber, EPR, EPT, EPDM

Hardness Range	30 to 90 Durometer Shore A
Temperature Range	-60° F to +300° F

**Advantages** in performance:

- for adhesion to metal & rigid materials and compression set.
- in performance in most acids, alcohol's, aldehydes, alkalis, brake fluids, esters, ketones, and silicone oils.
- in performance for coloring capabilities, ozone resistance, oxidation resistance, steam resistance, sunlight resistance, taste retention, weather resistance, and water resistance.

**Limitations** in performance:

- in diester oils, petroleum-based fuels & oils including aliphatic hydrocarbons, aromatic & non-aromatic hydrocarbons, extended or oxygenated fuels.
- as well as halogenated solvents, halogenated hydrocarbons, lacquer solvents, LP gases & fuels, mineral oils, refrigerant halofluorocarbons with oil, and flame resistance.

### FKM – Fluorocarbon, Fluoroelastomer Rubber, Viton<sup>®</sup>, Fluorel<sup>®</sup>

Hardness Range	55 to 95 Durometer Shore A
Temperature Range	-30° F to +500° F

**Advantages** in performance:

- for adhesion to metal and for compression set.
- in dilute acids, concentrated acids, inorganic acids, alcohol's, animal & vegetable oils, diester oils, aryl phosphate esters, petroleum-based fuels & oils including aliphatic hydrocarbons, aromatic hydrocarbons, non-aromatic hydrocarbons, bio-diesel, extended or oxygenated fuels, as well halogenated solvents, halogenated hydrocarbons, mineral oils, LP gases & fuels, and silicone oils.
- for coloring capability, flame resistance, low gas permeability, ozone resistance, oxidation resistance, steam resistance, sunlight resistance, weather resistance, and water resistance.

**Limitations** in performance:

- in performance in organic acids concentrated, aldehydes, alkalis concentrated, amines, brake fluids, alkyl phosphate esters, ethers, ketones, lacquer solvents, and refrigerant ammonia.

Viton<sup>®</sup> is a registered trademark of the DuPont Corporation.

Fluorel<sup>®</sup> is a registered trademark of the Dyneon Division of 3M Corporation.

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### FVMQ – Fluorosilicone or Fluorovinylmethylsiloxane Rubber

Hardness Range	35 to 80 Durometer Shore A
Temperature Range	-85° F to +450° F

**Advantages** in performance:

- for adhesion to metal, resilience & rebound, and in certain formulations, tear resistance.
- in dilute acids, alcohol's, dilute alkalis, animal & vegetable oils, diester oils, aryl phosphate esters, fuels including aliphatic hydrocarbons, aromatic hydrocarbons, extend or oxygenated fuels, halogenated solvents, LP gases & fuel oils, refrigerant ammonia, silicone oils, and selected solvents.
- for coloring capability, flame resistance, ozone resistance, oxidation resistance radiation resistance, sunlight resistance, weather resistance, and water resistance.

**Limitations** in performance:

- for abrasion resistance, flex cracking resistance, impact resistance, and in certain formulations, tear resistance.
- in amines, brake fluids, alkyl phosphate esters, ketones, and lacquer solvents.
- for gas permeability.

### HNBR – Highly Saturated Nitrile or Hydrogenated Acrylonitrile Butadiene

Hardness Range	40 to 95 Durometer Shore A
Temperature Range	-60° F to +325° F

**Advantages** in performance:

- for abrasion resistance, adhesion to metal & rigid materials, compression set, impact resistance, tear resistance, and vibration dampening.
- in alcohols, animal & vegetable oils, aliphatic hydrocarbon fuels, extended or oxygenated fuels, LP gases & fuel oils, mineral oils, aromatic & non-aromatic petroleum products, and silicone oils.
- for coloring capabilities, low gas permeability, ozone resistance, oxidation resistance, sunlight resistance, weather resistance, and water resistance.

**Limitations** in performance:

- in concentrated alkalis, alkyl phosphate esters, aryl phosphate esters, ethers, halogenated solvents, halogenated hydrocarbons, ketones, and selected solvents.
- for flame resistance.

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### IIR – Isobutylene Isoprene Rubber, Butyl, Bromobutyl, Chlorobutyl Rubber

Hardness Range	30 to 90 Durometer Shore A
Temperature Range	-70° F to +300° F

**Advantages** in performance:

- for flex cracking resistance and vibration dampening.
- in dilute acids, concentrated acids, alcohols, dilute alkalis, concentrated alkalis, animal & vegetable oils, alkyl phosphate esters, aryl phosphate esters, and certain ketones.
- for ozone resistance, oxidation resistance, steam resistance, sunlight resistance, weather resistance, and water resistance.

**Limitations** in performance:

- in diester oils, ethers, aliphatic hydrocarbon fuels, aromatic hydrocarbon fuels, extended or oxygenated fuels, halogenated solvents, halogenated hydrocarbons, certain ketones, LP gases & fuel oils, mineral oils, aromatic & non- aromatic petroleum products, refrigerant halofluorocarbons with oil, silicone oil, and selected solvents.
- for flame resistance and radiation resistance.

### NR – Natural Polyisoprene Rubber, Natural Rubber

Hardness Range	30 to 95 Durometer Shore A
Temperature Range	-70° F to +200° F

**Advantages** in performance:

- for abrasion resistance, adhesion to metal & rigid materials, compression set, flex cracking resistance, impact resistance, resilience & rebound, tear resistance, and vibration dampening.
- in dilute acids, alcohols, and dilute alkalis.
- for odor and water resistance.

**Limitations** in performance:

- in certain concentrated acids, amines, animal & vegetable oils, diester oils, alkyl phosphate esters, aryl phosphate esters, ethers, aliphatic hydrocarbon fuel, aromatic hydrocarbon fuel, extended or oxygenated fuel, halogenated solvents, halogenated hydrocarbons, lacquer solvents, LP gases & fuel oils, mineral oils, aromatic & non-aromatic petroleum products, and refrigerant halofluorocarbons with oil.
- for coloring capabilities, ozone resistance, sunlight resistance, and weather resistance.

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### **NBR – Acrylonitrile Butadiene, Nitrile Rubber, Buna N Rubber**

<b>Hardness Range</b>	20 to 95 Durometer Shore A
<b>Temperature Range</b>	-70° F to +250° F

**Advantages** in performance:

- for abrasion resistance, adhesion to metal & rigid materials, compression set, and tear resistance.
- in animal & vegetable oils, aliphatic hydrocarbon fuels, LP gases & fuel oils, mineral oils, non-aromatic petroleum, and certain solvents.
- for coloring capability, gas permeability, and water resistance.

**Limitations** in performance:

- in concentrated acids, concentrated organic acids, aldehydes, concentrated alkalis, amines, brake fluids, alkyl phosphate esters, aryl phosphate esters, ethers, halogenated solvents, halogenated hydrocarbons, and ketones.
- for flame resistance and sunlight resistance.

### **CR – Polychloroprene Rubber, Neoprene® Rubber**

<b>Hardness Range</b>	20 to 95 Durometer Shore A
<b>Temperature Range</b>	-70° F to +250° F

**Advantages** in performance:

- for abrasion resistance, adhesion to metal & rigid materials, impact resistance, tear resistance, and vibration dampening.
- in dilute acids, dilute organic acids, alcohols, refrigerant ammonia, and silicone oil.
- for ozone resistance, oxidation resistance, and sunlight resistance.

**Limitations** in performance:

- for compression set.
- in concentrated acids, concentrated organic acids, aldehydes, concentrated alkalis, amines, diester oils, alkyl phosphate esters, aryl phosphate esters, ethers, aliphatic hydrocarbon fuels, aromatic hydrocarbon fuels, halogenated solvents, halogenated hydrocarbon, ketones, and lacquer solvents.

Neoprene® is a registered trademark of the DuPont Corporation.

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### ACM – Polyacrylate or Acrylic Rubber

**Hardness Range**

40 to 90 Durometer Shore A

**Temperature Range**

-30° F to +400° F

**Advantages** in performance:

- for vibration dampening.
- in aliphatic hydrocarbon fuels, mineral oils, and silicone oil.
- for gas permeability, ozone resistance, oxidation resistance, sunlight resistance, weather resistance, and water resistance.

**Limitations** in performance:

- for compression set, impact resistance, and tear resistance.
- in concentrated acids, dilute organic acids, concentrated organic acids, alcohols, aldehydes, amines, brake fluids, alkyl phosphate esters, aryl phosphate esters, ethers, aromatic hydrocarbon fuels, halogenated solvents, halogenated hydrocarbons, ketones, and lacquer solvents.
- for flame resistance, radiation resistance, and steam resistance.

### BR – Polybutadiene Rubber

**Hardness Range**

45 to 80 Durometer Shore A

**Temperature Range**

-90° F to +200° F

**Advantages** in performance:

- for abrasion resistance, flex cracking resistance, resilience & rebound, and tear resistance.
- in dilute acids, dilute organic acids, alcohols, aldehydes, dilute alkalis, concentrated alkalis, ketones, and refrigerant ammonia.
- for coloring capability, oxidation resistance and water resistance.

**Limitations** in performance:

- in concentrated organic acids, amines, animal & vegetable oils, brake fluids, diester oils, alkyl phosphate esters, aryl phosphate esters, ethers, aliphatic hydrocarbon fuels, aromatic hydrocarbon fuels, extended or oxygenated fuels, halogenated solvents, lacquer solvents, LP gases & fuel oils, mineral oils, aromatic petroleum, non-aromatic petroleum, refrigerant halofluorocarbons with oils, silicone oil, and certain solvents.
- for flame resistance, ozone resistance, radiation resistance, sunlight resistance, and weather resistance.

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### VMQ / PMQ / PVMQ – Silicone or Polydimethylsiloxane Rubber

<b>Hardness Range</b>	20 to 90 Durometer Shore A
<b>Temperature Range</b>	-150° F to +550° F

**Advantages** in performance:

- for adhesion to metal & rigid materials, compression set, and resilience & rebound.
- in concentrated alkalis, animal & vegetable oils, and refrigerant ammonia.
- for coloring capability, flame resistance, ozone resistance, oxidation resistance, sunlight resistance, taste retention, weather resistance, and water resistance.

**Limitations** in performance:

- for abrasion resistance, flex cracking resistance, impact resistance, and tear resistance.
- in concentrated acids, dilute alkalis, concentrated alkalis, diester oils, ethers, aliphatic hydrocarbon fuels, aromatic hydrocarbon fuels, extended or oxygenated fuels, halogenated solvents, halogenated hydrocarbons, ketones, lacquer solvents, mineral oils, refrigerant halofluorocarbons with & without oils, and silicone oils.
- for gas permeability and radiation resistance.

### SBR – Styrene Butadiene Rubber

<b>Hardness Range</b>	30 to 95 Durometer Shore A
<b>Temperature Range</b>	-60° F to +220° F

**Advantages** in performance:

- for abrasion resistance, adhesion to metal and rigid materials, compression set, impact resistance, and tear resistance.
- in dilute acids, certain dilute organic acids, certain concentrated organic acids, alcohols, dilute alkalis, certain concentrated alkalis, certain amines, animal & vegetable oils, certain brake fluid applications, certain ketones, and refrigerant ammonia.
- for coloring capability, odor, oxidation resistance, radiation resistance, steam resistance, taste retention, weather resistance, and water resistance.

**Limitations** in performance:

- for tear resistance and vibration dampening certain polymers.
- in certain concentrated acids, in certain concentrated organic acids, certain aldehydes, certain amines, certain animal and vegetable oils, certain brake fluids, diester oils, alkyl phosphates esters, aryl phosphate esters, ethers, aliphatic hydrocarbon fuels, aromatic hydrocarbon fuels, extended or oxygenated fuels, halogenated solvents, halogenated hydrocarbons, certain ketones, lacquer solvents LP gases & fuel oils, mineral oils, aromatic & non-aromatic petroleum, refrigerant halofluorocarbons with oil, and silicone oil.
- for flame resistance, ozone resistance, and sunlight resistance.



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### SNR / IR – Synthetic Polyisoprene, Synthetic Natural Rubber

Hardness Range

30 to 95 Durometer Shore A

Temperature Range

-70° F to +200° F

#### **Advantages** in performance:

- for abrasion resistance, adhesion to metal & rigid materials, compression set, flex cracking resistance, impact resistance, resilience & rebound, tear resistance, and vibration dampening.
- in certain dilute acids, alcohols, and certain dilute alkalis.
- for odor and water resistance.

#### **Limitations** in performance:

- in certain concentrated acids, certain amines, certain animal & vegetable oils, diester oils, alkyl phosphate esters, aryl phosphate esters, ethers, aliphatic hydrocarbon fuels, aromatic hydrocarbon fuels, extended or oxygenated fuels, halogenated solvents, halogenated hydrocarbons, lacquer solvents, LP gases & fuel oils, mineral oils, aromatic petroleum, non-aromatic petroleum, and refrigerant halofluorocarbons with oil.
- for coloring capability, ozone resistance, sunlight resistance, and weather resistance.

### URE / AU / EU – Polyester & Polyether Urethane Rubber

Hardness Range

30 to 95 Durometer Shore A

Temperature Range

-65° F to +200° F

#### **Advantages** in performance:

- for abrasion resistance, adhesion to metal, flex cracking resistance, impact resistance, and tear resistance.
- in animal & vegetable oils, aliphatic hydrocarbon fuels, mineral oils, and silicone oil.
- for coloring capability, gas permeability, oxidation resistance, radiation resistance, sunlight resistance, and weather resistance.

#### **Limitations** in performance:

- for compression set, resilience and rebound, and vibration dampening.
- in concentrated acids, concentrated acids, organic concentrated acids, aldehydes, concentrated alkalis, amines brake fluids, diester oils, alkyl phosphate esters, aryl phosphate esters, aromatic hydrocarbon fuels, halogenated solvents, ketones, lacquer solvents, and refrigerant ammonia.
- for flame resistance, steam resistance, and water resistance.



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### **XNBR – Carboxylated Nitrile Rubber**

**Hardness Range**

50 to 90 Durometer Shore A

**Temperature Range**

-50° F to +250° F

**Advantages** in performance:

- for excellent abrasion resistance, adhesion to metals & rigid materials, and compression set.
- in animal & vegetable oils, aliphatic hydrocarbon fuels, LP gases & fuel oils, mineral oils, non-aromatic petroleum, and certain solvents.
- for toughness & tear resistance.

**Limitations** in performance:

- due to lower resilience can limit flex fatigue resistance.
- in concentrated acids, concentrated organic acids, aldehydes, concentrated alkalis, amines, brake fluids, alkyl phosphate esters, aryl phosphate esters, ethers, halogenated solvents, halogenated hydrocarbons, and ketones.
- for flame resistance and sunlight resistance.

**For assistance in identifying the appropriate polymer or material, contact Robinson Rubber Products at [sales@robinsonrubber.com](mailto:sales@robinsonrubber.com) or +1-763-535-6737.**