Properties of Rubber

Polymer Base	Good Points	Bad Points
Natural Rubber	▪ The raw material to make natural rubber comes from trees ▪ Produces compounds with high tensile strength, tear strength, tear and abrasion resistance ▪ Can be used at low temperatures, low compression set, high resilience ▪ Maximum continuous operating temperature about 225°F	▪ Not recommended for severe applications with oil and solvent exposure ▪ Subject to aging by sun, ozone and heat, but most of these can be overcome with specific raw materials ▪ Not good for applications in contact with concentrated acids or alkalies
Neoprene (Chloroprene)	▪ Good general purpose rubber with properties close to NR; synthetically produced ▪ Better resistance to oils and solvents compared to NR but similar low compression set ▪ Maximum continuous operating temperature about 275°F	▪ Poorer low temperature performance compared to natural rubber ▪ Not good in applications with concentrated acids or alkalies
Nitrile (Buna)	▪ Much better oil and solvent resistance compared to either natural rubber or Neoprene ▪ Recommended for most oilfield applications ▪ Can be formulated for use at low temperatures ▪ Good compression set and abrasion resistance ▪ Can be used with concentrated acids and alkalies but there are better alternatives ▪ Maximum continuous operating temperature about 275°F	▪ Poor weathering resistance
HNBR (Hydrogenated Nitrile)	▪ "Cousin" to Nitrile but with improvements in heat and ozone resistance ▪ Can be formulated for low temperature applications ▪ Excellent for oil field service ▪ Maximum continuous operating temperature about 350°F	▪ Although excellent for oil field industry, not recommended in applications with concentrated acids or alkalies ▪ Very high cost

Properties of Rubber

Styrene Butadiene (SBR)	▪ Originally developed as a low cost substitute for natural rubber but not necessarily always the case ▪ Good water resistance and abrasion resistance ▪ Maximum continuous operating temperature about 225°F	▪ Poor weathering, but can overcome with specific raw materials ▪ Not recommended for contact with oils and solvents ▪ Not really used with concentrated acids or alkalies
Butyl	▪ Rather than "real" butyl, Holz uses a chemically different material that has the same properties ▪ Very good resistance to most gases (including air) ▪ Highly resistant to ozone and weathering ▪ Abrasion resistance close to natural rubber ▪ Good for concentrated acids and alkalies ▪ Maximum continuous operating temperature about 300°F	▪ Not recommended for petroleum product exposure
EPDM	▪ Exceptional resistance to weathering and ozone ▪ Excellent water resistance and most gases ▪ Very good resistance to steam, heat aging and exposure to concentrated acids and alkalies ▪ Maximum continuous operating temperature about 350°F	▪ Not recommended for exposure to oils and solvents
FKM/fluorocarbon (Viton®) *Viton® is a trademark of DuPont*	▪ High performance material ▪ Outstanding resistance to most chemicals, oils and solvents ▪ Good oxidation and ozone resistance ▪ Maximum continuous operating temperature about 350°F	▪ High cost
"AFLAS"	▪ Similar to FKM, but with improved steam aging resistance ▪ Most often used in very specific oilfield applications ▪ Maximum continuous operating temperature about 400°F	▪ Lower overall temperature resistance ▪ Very costly