# CAT® PRECISION SEALS

## Load Ring Materials

**Load Ring Materials.** Several load ring materials are available to meet a variety of application requirements. The most common materials are nitrile and silicone, while FKM and Hydrogenated Nitrile (HNBR) are available for more specialized applications. The table below provides a brief comparison of available load ring options.

| | Nitrile | LT Nitrile | Silicone | HNBR | FKM |
|---|---|---|---|---|---|
| **Low T Limit (°C)** | –17 | –30 | –55 | –40 | –7 |
| **High T Limit (°C)** | 93 | 93 | 150 | 135 | 160 |
| **Tear Resistance** | Good | Good | Poor | Good | Good |
| **Abrasion Resistance** | Excellent | Excellent | Poor | Excellent | Good |
| **Oil Resistance** | Excellent | Excellent | Poor | Excellent | Excellent |
| **Water Resistance** | Excellent | Excellent | Excellent | Excellent | Fair |
| **Cost** | Low | Low | Medium | Medium | High |

### Nitrile (NBR)

Nitrile is recommended for temperatures ranging from –17° C to 93° C (–2° F to 200° F) continuous and is compatible with most mineral based lubricant oil. Nitrile load rings offer the maximum resistance to abrasion. It is the most common load ring material choice and is used in most standard axle, final drive and undercarriage applications.

### Low Temperature Nitrile (LTN)

Low temperature nitrile is recommended for temperatures ranging from –30° C to 93° C (–22° F to 200° F). Low temperature nitrile was specifically developed for highly abrasive, low temperature applications. Typical applications include undercarriage idlers, rollers and final drives but LTN can also be found in wheel and axle applications as well.

### Silicone (VMQ)

Silicone is recommended for temperatures ranging from –55° C to 150° C (–67° F to 302° F) continuous. It is not compatible with fuels or certain types of gear lubricants. Silicone also has inferior abrasion resistance compared to nitrile. Typically, silicone uses are: extreme high (wet disc brake systems) or extreme low (arctic environment) temperature applications.

### Hydrogenated Nitrile (HNBR)

HNBR is a nitrile-based material recommended for temperature ranging from –40° C to 135° C (–40° F to 275° F). It has very similar abrasion resistance characteristics to standard nitrile, but HNBR has better resistance to permanent deformation when exposed to high temperatures for extended periods of time.

### Flourocarbon (FKM)

FKM is a fluoroelastomer. It has a recommended temperature range between –7° C to 160° C (20° F to 320° F). FKM is typically used in steel mill applications where extremely high temperatures are a concern and low temperatures are never a problem. FKM has very poor low temperature capability and will harden at temperatures approaching freezing.

BUILT FOR IT.™



CATERPILLAR®