

# ENGINEERING

## Lubrication

**Table 26. Typical oil lubricants recommended for use in Barden Precision Bearings.**

| Barden Code | Designation            | Base Oil                 | Operating Temperature Range °F | Maximum dN | Comments                                                                                                                                                |
|-------------|------------------------|--------------------------|--------------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0-9         | Exxon instrument oil   | Petroleum                | -65 to 150                     | 1,500,000* | Anti-oxidation, anti-corrosion E.P. additives.                                                                                                          |
| 0-11        | Winsorlube L-245X      | Diester                  | -65 to 175                     | 1,500,000* | Attacks paint, neoprene, anti-corrosion additives. MIL-L-6085.                                                                                          |
| 0-14        | Exxon Turbo Oil #2389  | Diester                  | -65 to 350                     | 1,500,000* | Anti-oxidation, additives, MIL-L-7808.                                                                                                                  |
| 0-28        | Mobil SHF-61           | Synthetic hydrocarbon    | -65 to 350                     | 1,500,000* | Good heat stability, low volatility.                                                                                                                    |
| 0-49        | Exxon Turbo Oil #2380  | Diester                  | -65 to 350                     | 1,500,000* | Anti-oxidation additives, MIL-L-23699.                                                                                                                  |
| 0-50        | NYE Synthetic 181B     | Synthetic hydrocarbon    | -40 to 300                     | 1,500,000* | Good heat stability, low volatility.                                                                                                                    |
| 0-59        | Bray Micronic 815Z     | Perfluorinated polyether | -100 to 500                    | 400,000    | Low surface tension, but does not migrate.                                                                                                              |
| 0-62        | Du Pont Krytox 1506    | Fluorocarbons            | -60 to 550                     | 400,000    | Low surface tension, but does not migrate.                                                                                                              |
| 0-64        | NYE Synthetic Oil 2001 | Synthetic hydrocarbon    | -50 to 260                     | 400,000    | Instrument, general purpose lubricant excellent for use in hard vacuum applications where very low out gas properties are desired                       |
| OJ-201      | Aeroshell Fluid 12     | Synthetic Ester          | -65 to 300                     | 1,500,000* | MIL-L-6085, Attacks paint, natural rubber, and neoprene. Contains anti-corrosion additives.                                                             |
| OJ-228      | Nycolube 11B           | Synthetic Ester          | -65 to 300                     | 1,500,000* | MIL-L-6085, Attacks paint, natural rubber, and neoprene. Contains anti-corrosion additives.                                                             |
| OJ-262      | Anderol L465           | Synthetic                | -20 to 450                     | 1,500,000* | Low out gas properties for wide temperature range. Contains anti-corrosion, and anti-oxidation additives. Contains anti-corrosion, anti-wear additives. |
| OJ-273      | Nyosil M25             | Silicone                 | -58 to 390                     | 200,000    | Low surface tension, tends to migrate.                                                                                                                  |

\* Max dN for continuous oil supply.

each with its own special characteristics and advantages for specific applications. The most common types of thickeners used in precision bearing applications are:

- **Barium complex:** non-channeling, water resistant.
- **Sodium:** channeling type, water soluble, low torque.
- **Lithium:** non-channeling, offers good water resistance, generally soft.
- **Polyurea:** non-channeling, water resistant very quiet running.
- **Clay:** non-channeling, water resistant, can be noisy in miniature and instrument bearings.
- **Teflon:** non-channeling, water resistant, chemical inertness, non-flammable, excellent oxidative and thermal stability.

**Grease Quantity.** "If a little is good, more is better!" Not always true! Too much grease can cause ball skid, localized over-heating in the ball contact area, cage pocket wear, and rapid bearing failure under certain conditions of operation. Generally, for precision high speed applications, grease quantity in a bearing should be

about 20% to 30% full, based on the free internal space in a specific bearing. This quantity may be modified to meet the requirements of the application regarding torque, life, and other specifics.

**Grease Filtering.** Greases for precision bearings are factory filtered to preclude loss of precision, noise generation, high torque, and premature failure in the application. There is no intermediate grease container following the filtering operation since the in-line filter injects the grease into the bearings immediately prior to bearing packaging.

Grease filter sizes range from about 10 to 40 microns depending on grease variables such as thickener and additive particle size.

### Oil Considerations

While grease lubrication is inherently simpler than lubrication with oil, there are applications where oil is the better choice.