

---

 Excelling in Lubricating Properties
 

---

# Polyoxyalkylene Glycol-Type Lubricants

## Preface

Our company offers a wide range of polyoxyalkylene glycol-type lubricants which are useful to apply as hydraulic fluids (water and glycol-type), high-temperature lubricants, low-temperature lubricating oil, compressor oil, vacuum pump oil, gear oil, hydraulic fluids, brake fluids for cars, grease, engine detergent, water-soluble cutting fluids, drawing oil, quenching oil, heating medium, mold-releasing agents for resins and rubber, lubricants for textile industries, defoaming agents, etc.

We offer the following range of polyoxyalkylene glycol-type lubricants.

| Product Name     | Number-Average Molecular Weight | Composition  | Remark  |
|------------------|---------------------------------|--|---|
| NEWPOL LB-65     | 340                             | Polyoxypropylene glycol monoalkyl ether                          | Water insolubility                            |
| NEWPOL LB-285    | 1,170                           |  |   |
| NEWPOL LB-385    | 1,480                           |  |   |
| NEWPOL LB-625    | 1,870                           |  |   |
| NEWPOL LB-1715   | 2,390                           |  |   |
| NEWPOL LB-3000   | 3,070                           |  |   |
| NEWPOL LB-300 X  | 1,170                           | Polyoxypropylene glycol monoalkyl ether (containing antioxidant) |   |
| NEWPOL LB-650 X  | 1,870                           |  |   |
| NEWPOL LB-1800 X | 2,390                           |  |   |
| NEWPOL LB-400 XY | 1,480                           |  |   |
| NEWPOL 50HB-55   | 300                             | Poly(oxyethylene, oxypropylene) glycol monoalkyl ether           | Water solubility                              |
| NEWPOL 50HB-260  | 970                             |  |   |
| NEWPOL 50HB-400  | 1,340                           |  |   |
| NEWPOL 50HB-660  | 1,800                           |  |   |
| NEWPOL 50HB-2000 | 3,200                           |  |   |
| NEWPOL 50HB-5100 | 3,750                           |  |   |
| NEWPOL 75H-90000 | 14,000                          | Poly(oxyethylene, oxypropylene) glycol                           | Water solubility (high molecular-weight type) |
| NEWPOL V-10-C    | 22,400                          | Poly(oxyethylene, oxypropylene) polyol                           |   |

Annotation) Number-average molecular weight: hydroxyl value conversion

---



---

Typical Properties

---



---

### 1. Typical Properties

The typical properties of polyoxyalkylene glycol-type lubricants are shown in Tables 1-a and 1-b. The values are representative.

Table 1-a. Typical Properties

| Product Name     | Appearance | Color | Kinematic Viscosity<br>mm <sup>2</sup> /s |       | Viscosity Index<br>(VI) | Pour Point<br>°C | Coefficient of Friction<br>(30°C) | Pressure Resistance<br>kPa |
|------------------|------------|-------|---|-------|-------------------------|------------------|-----------------------------------|----------------------------|
|                  |            |       | 20°C                                      | 100°C |                         |                  |                                   |                            |
| NEWPOL LB-65     | Liquid     | 10    | 18  | 2     | 63                      | ≤ - 50           | 0.198                             | 294                        |
| NEWPOL LB-285    | Liquid     | 10    | 161                                       | 11    | 192                     | ≤ - 50           | 0.164                             | 343                        |
| NEWPOL LB-385    | Liquid     | 10    | 190                                       | 14    | 197                     | - 43             | 0.162                             | 343                        |
| NEWPOL LB-625    | Liquid     | 10    | 325                                       | 22    | 212                     | - 40             | 0.160                             | 392                        |
| NEWPOL LB-1715   | Liquid     | 10    | 980                                       | 56    | 232                     | - 38             | 0.133                             | 539                        |
| NEWPOL LB-3000   | Liquid     | 10    | 1,665                                     | 92    | 248                     | - 30             | 0.120                             | 490                        |
| NEWPOL LB-300X   | Liquid     | 20    | 171                                       | 12    | 190                     | ≤ - 50           | 0.164                             | 343                        |
| NEWPOL LB-650X   | Liquid     | 20    | 344                                       | 22    | 211                     | - 40             | 0.160                             | 392                        |
| NEWPOL LB-1800X  | Liquid     | 20    | 1,014                                     | 55    | 226                     | - 38             | 0.133                             | 539                        |
| NEWPOL LB-400XY  | Liquid     | 20    | 221                                       | 16    | 197                     | - 43             | 0.150                             | 441                        |
| NEWPOL 50HB-55   | Liquid     | 10    | 16  | 2     | 92                      | ≤ - 50           | 0.178                             | 343                        |
| NEWPOL 50HB-260  | Liquid     | 10    | 119                                       | 11    | 212                     | - 49             | 0.149                             | 392                        |
| NEWPOL 50HB-400  | Liquid     | 10    | 192                                       | 16    | 218                     | - 48             | 0.141                             | 588                        |
| NEWPOL 50HB-660  | Liquid     | 10    | 343                                       | 26    | 231                     | - 45             | 0.134                             | 539                        |
| NEWPOL 50HB-2000 | Liquid     | 10    | 1,004                                     | 69    | 258                     | - 35             | 0.118                             | 588                        |
| NEWPOL 50HB-5100 | Liquid     | 10    | 2,263                                     | 145   | 282                     | - 30             | 0.114                             | 882                        |
| NEWPOL 75H-90000 | Liquid     | 20    | 56,200                                    | 2,750 | 439                     | -3               | -                                 | -                          |
| NEWPOL V-10-C    | Liquid     | 10    | -   | 3,300 | -                       | -10              | -                                 | -                          |

Table 1-b. Typical Properties

| Product Name     | Surface Tension<br>mN/m<br>(20°C) | Specific Gravity<br>(20°C<br>/4°C) | Vapor Pressure<br>(20°C)<br>Pa | Coefficient of<br>Expansion<br>°C <sup>-1</sup> (20°C) | Specific Heat J/g |      |       |       | Flash Point<br>°C<br>(COC) | Refractive<br>Index<br>(20°C) |
|------------------|-----------------------------------|------------------------------------|--------------------------------|--|-------------------|------|-------|-------|----------------------------|-------------------------------|
|                  |                                   |                                    |                                |  | 0°C               | 50°C | 100°C | 150°C |                            |                               |
| NEWPOL LB-65     | 32.5                              | 0.962                              | <1.33                          | 8.1×10 <sup>-4</sup>                                   | 1.76              | 1.93 | 2.05  | 2.22  | 148                        | 1.438                         |
| NEWPOL LB-285    | 34.5                              | 0.991                              | <1.33                          | 7.6×10 <sup>-4</sup>                                   | 1.76              | 1.93 | 2.05  | 2.22  | 217                        | 1.448                         |
| NEWPOL LB-385    | 34.5                              | 0.996                              | <1.33                          | 7.6×10 <sup>-4</sup>                                   | 1.76              | 1.93 | 2.05  | 2.22  | 220                        | 1.449                         |
| NEWPOL LB-625    | 34.5                              | 1.000                              | <1.33                          | 7.6×10 <sup>-4</sup>                                   | 1.76              | 1.93 | 2.05  | 2.22  | 222                        | 1.450                         |
| NEWPOL LB-1715   | 35.0                              | 1.003                              | <1.33                          | 7.4×10 <sup>-4</sup>                                   | 1.76              | 1.93 | 2.05  | 2.22  | 228                        | 1.452                         |
| NEWPOL LB-3000   | -                                 | 1.006                              | <1.33                          | -  | 1.76              | 1.93 | 2.05  | 2.22  | 230                        | 1.456                         |
| NEWPOL LB-300X   | -                                 | 0.996                              | <1.33                          | 7.6×10 <sup>-4</sup>                                   | 1.76              | 1.93 | 2.05  | 2.22  | 236                        | 1.452                         |
| NEWPOL LB-650X   | -                                 | 1.002                              | <1.33                          | 7.6×10 <sup>-4</sup>                                   | 1.76              | 1.93 | 2.05  | 2.22  | 252                        | 1.454                         |
| NEWPOL LB-1800X  | -                                 | 1.008                              | <1.33                          | 7.4×10 <sup>-4</sup>                                   | 1.76              | 1.93 | 2.05  | 2.22  | 258                        | 1.455                         |
| NEWPOL LB-400XY  | -                                 | 0.990                              | <1.33                          | -  | 1.76              | 1.93 | 2.05  | 2.22  | 215                        | 1.446                         |
| NEWPOL 50HB-55   | 32.5                              | 0.991                              | <1.33                          | 8.1×10 <sup>-4</sup>                                   | 1.76              | 1.93 | 2.05  | 2.22  | 93                         | 1.444                         |
| NEWPOL 50HB-260  | 35.8                              | 1.038                              | <1.33                          | 7.8×10 <sup>-4</sup>                                   | 1.76              | 1.93 | 2.05  | 2.22  | 225                        | 1.456                         |
| NEWPOL 50HB-400  | 36.4                              | 1.046                              | <1.33                          | 7.9×10 <sup>-4</sup>                                   | 1.76              | 1.93 | 2.05  | 2.22  | 246                        | 1.458                         |
| NEWPOL 50HB-660  | 36.8                              | 1.052                              | <1.33                          | 7.4×10 <sup>-4</sup>                                   | 1.76              | 1.93 | 2.05  | 2.22  | 225                        | 1.458                         |
| NEWPOL 50HB-2000 | 38.6                              | 1.058                              | <1.33                          | 7.4×10 <sup>-4</sup>                                   | 1.76              | 1.93 | 2.05  | 2.22  | 233                        | 1.460                         |
| NEWPOL 50HB-5100 | 38.4                              | 1.063                              | <1.33                          | 7.4×10 <sup>-4</sup>                                   | 1.76              | 1.93 | 2.05  | 2.22  | 251                        | 1.462                         |
| NEWPOL 75H-90000 | -                                 | 1.095                              | <1.33                          | -  | -                 | -    | -     | -     | 258                        | 1.466                         |
| NEWPOL V-10-C    | -                                 | 1.080                              | <1.33                          | -  | -                 | -    | -     | -     | 243                        | -                             |

## 2. Relationship Between Kinematic Viscosity and Temperature

Figures 1 and 2 show the relationship between the temperature of polyoxyalkylene glycol-type lubricants and the kinematic viscosity.

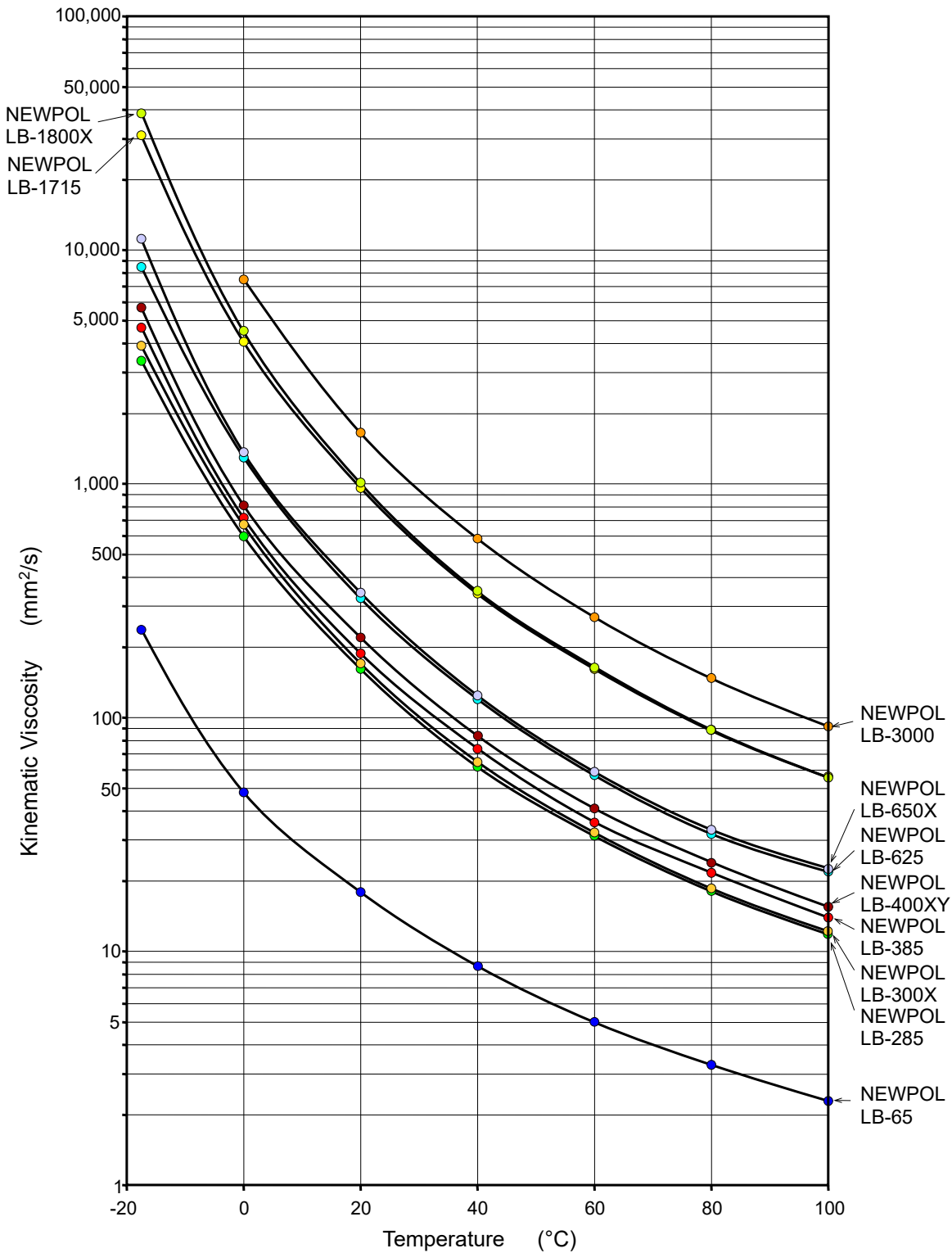


Figure 1. Relationship Between Temperature and Kinematic Viscosity

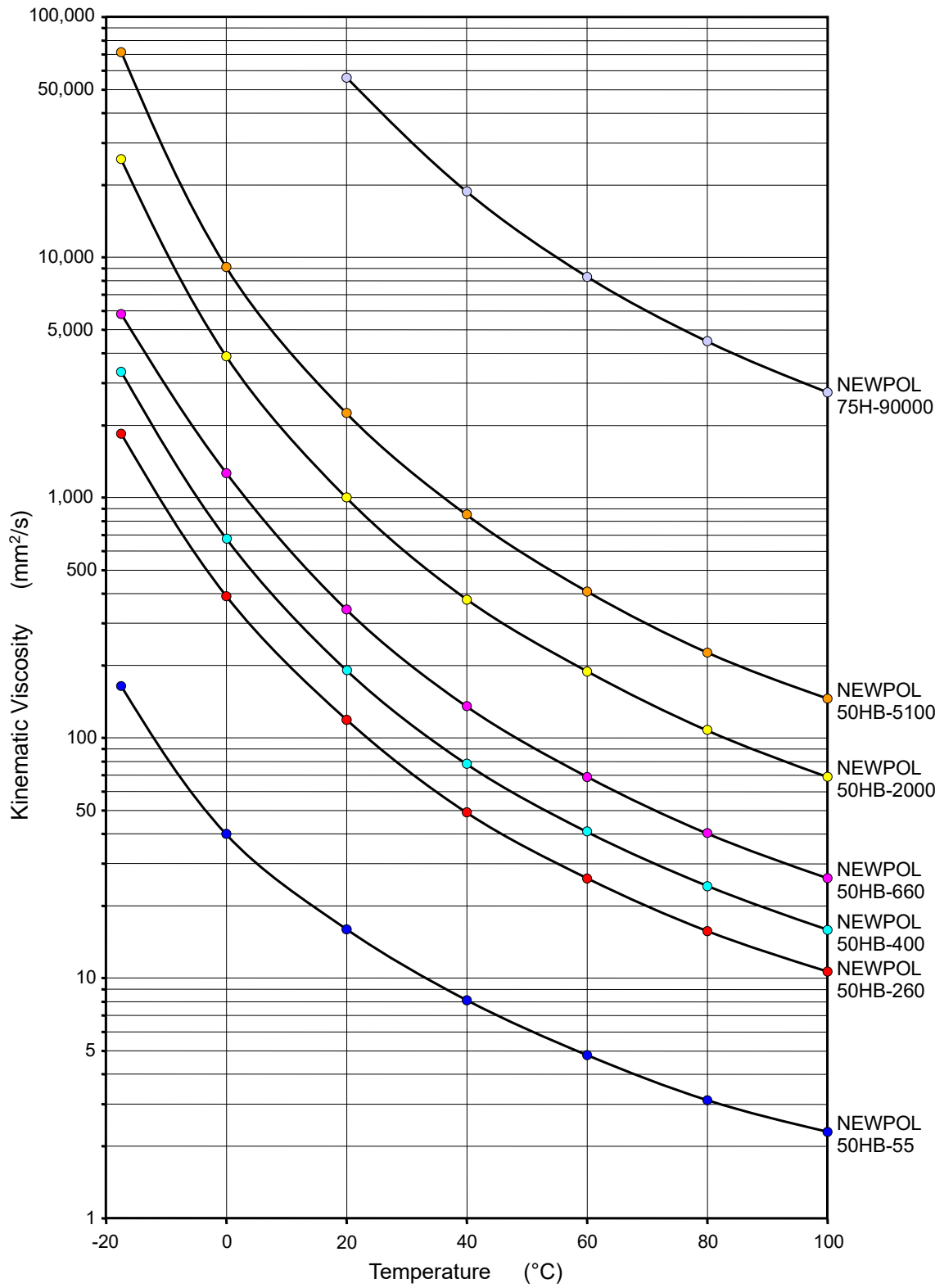


Figure 2. Relationship Between Temperature and Kinematic Viscosity

### 3. Moisture Absorbency

The moisture absorbency of polyoxyalkylene glycol-type lubricants is shown in Figure 3. The moisture absorbency varies according to the temperature, the humidity, the surface area of absorbing moisture and the amount of sample.

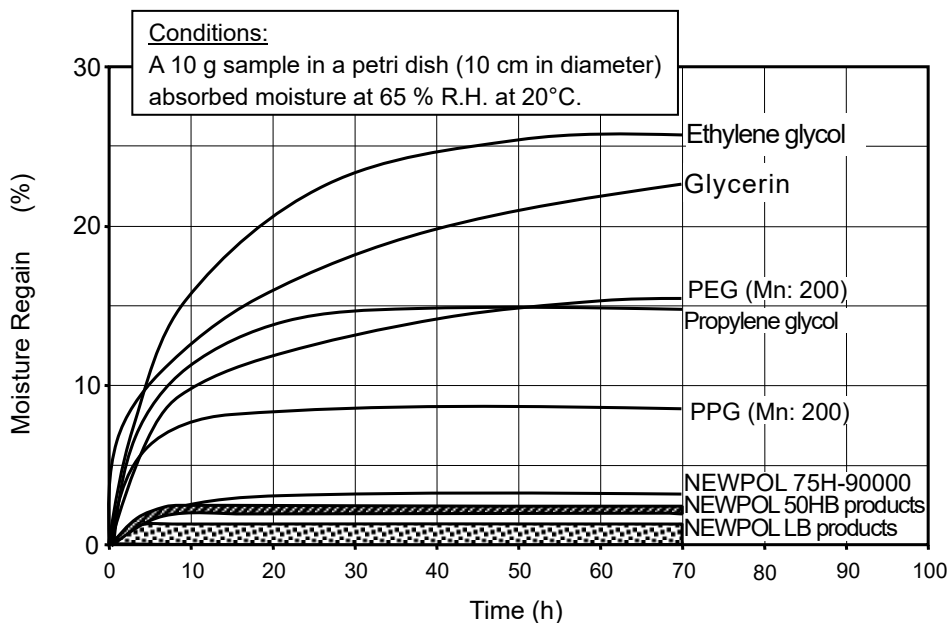


Figure 3. Moisture Absorbency

### 4. Solubility

Polyoxyalkylene glycol-type lubricants can be dissolved in toluene, benzene, morpholine, and most alcohols, ketones, glycol ethers or esters. The solubility for other solvents, fats and oils is shown in Table 2.

Table 2. Solubility

| Solvent, Fat and Oil | NEWPOL LB-285      | NEWPOL 50HB-660    |
|----------------------|--------------------|--------------------|
| Water                | Undissolved        | Dissolved          |
| Gasoline             | Dissolved          | Slightly dissolved |
| Kerosene             | Dissolved          | Undissolved        |
| Mineral oil          | Slightly dissolved | Slightly dissolved |
| Glycerin             | Undissolved        | Undissolved        |
| Ethylene glycol      | Undissolved        | Undissolved        |
| Propylene glycol     | Undissolved        | Dissolved          |
| Diethylene glycol    | Undissolved        | Dissolved          |
| Triethanolamine      | Undissolved        | Undissolved        |
| Ricinus              | Dissolved          | Dissolved          |
| Olive oil            | Dissolved          | Undissolved        |
| Camellia oil         | Dissolved          | Dissolved          |
| Coconut oil          | Dissolved          | Dissolved          |
| Tall oil             | Dissolved          | Dissolved          |

## 5. Characteristic of Aqueous Solution

The characteristics of water-soluble polyoxyalkylene glycol-type lubricants are shown as follows:

### a. Relationship Between Concentration and Kinematic Viscosity

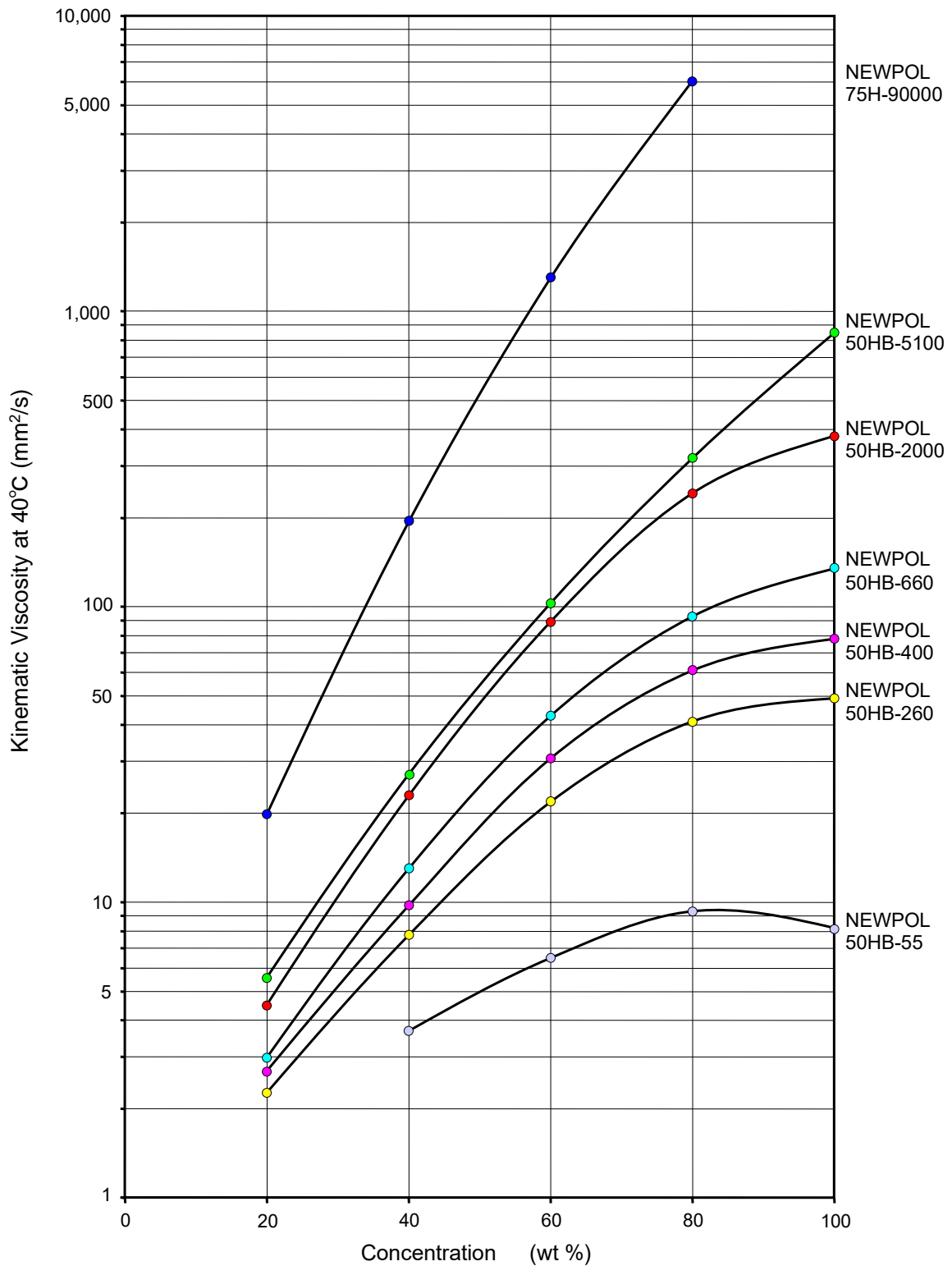


Figure 4. Concentration - Kinematic Viscosity Curve

b. Relationship Between Concentration and Freezing Point

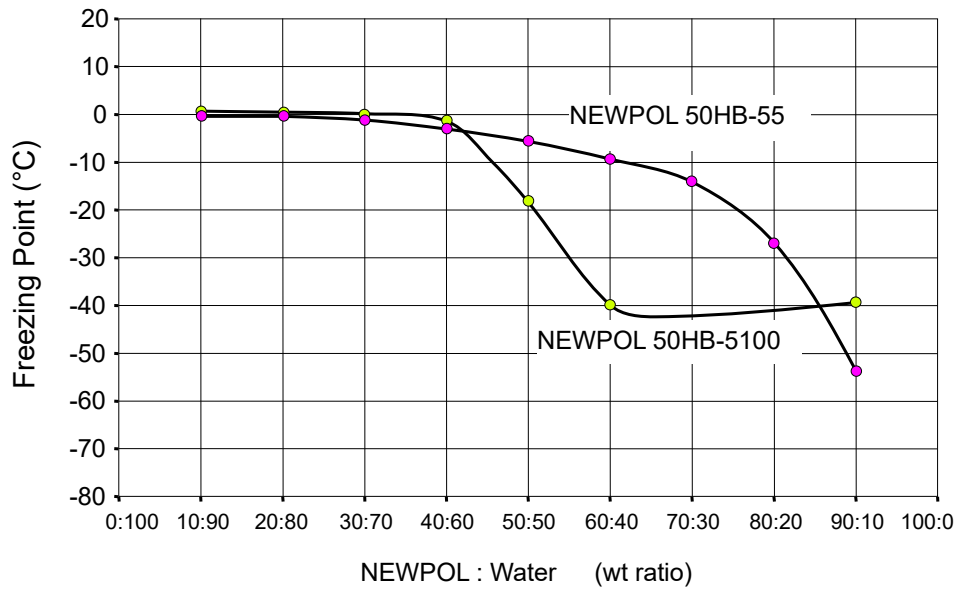


Figure 5. Concentration - Freezing Point Curve

c. Relationship Between Concentration and Cloud Point

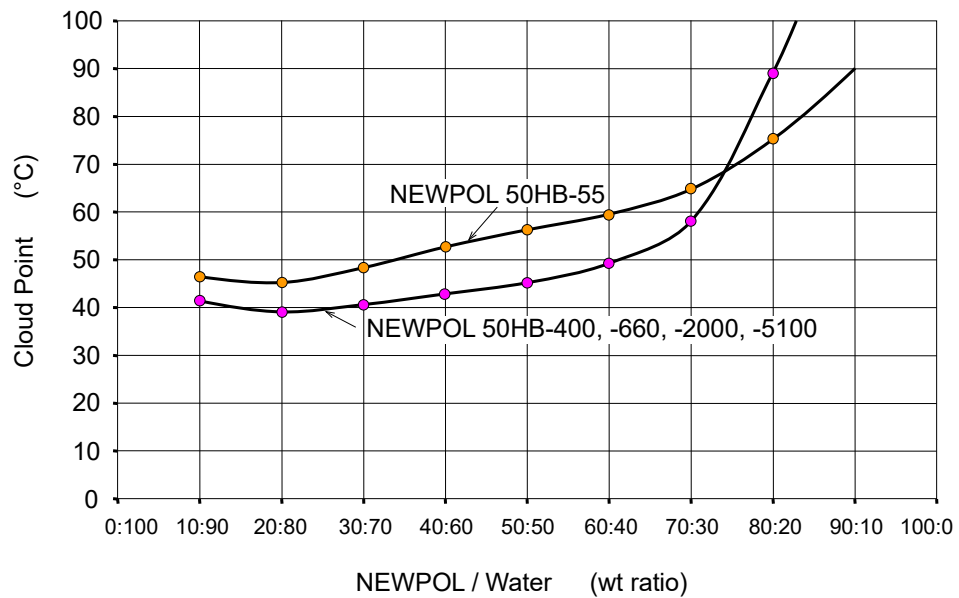


Figure 6. Concentration - Cloud Point Curve



---



---

Applications

---



---

### 1. Main Applications

The main applications of these products are shown in Table 3.

Table 3. Examples of Applications

| Product Name     | Hydraulic fluid (water and glycol-type) | High-temperature lubricant | Low-temperature lubricating oil | Compressor oil | Vacuum pump oil | Gear oil | Hydraulic fluid | Brake fluid for car | Grease | Engine detergent | Water-soluble cutting fluid | Drawing oil | Quenching oil | Heating medium | Mold-releasing agent for resins and rubber | Lubricants for textile industrie | Defoaming agent |
|------------------|---|----------------------------|---------------------------------|----------------|-----------------|----------|-----------------|---------------------|--------|------------------|-----------------------------|-------------|---------------|----------------|--|----------------------------------|-----------------|
| NEWPOL LB-65     |   |                            |                                 |                |                 |          |                 |                     |        |                  |                             |             |               |                |  |                                  | ✓               |
| NEWPOL LB-285    |   |                            | ✓                               |                |                 |          |                 |                     | ✓      | ✓                |                             |             |               |                |  |                                  | ✓               |
| NEWPOL LB-385    |   |                            | ✓                               |                |                 | ✓        |                 |                     |        |                  |                             |             |               |                |  |                                  | ✓               |
| NEWPOL LB-625    |   |                            | ✓                               | ✓              | ✓               | ✓        |                 |                     |        |                  |                             |             |               |                | ✓  |                                  | ✓               |
| NEWPOL LB-1715   |   |                            | ✓                               | ✓              | ✓               | ✓        |                 |                     | ✓      |                  |                             |             |               |                | ✓  |                                  | ✓               |
| NEWPOL LB-3000   |   |                            | ✓                               | ✓              | ✓               | ✓        |                 |                     | ✓      |                  |                             |             |               |                |  |                                  | ✓               |
| NEWPOL LB-300X   |   | ✓                          |                                 | ✓              | ✓               | ✓        |                 |                     |        |                  |                             |             |               | ✓              |  |                                  |                 |
| NEWPOL LB-650X   |   | ✓                          |                                 | ✓              | ✓               | ✓        |                 |                     | ✓      |                  |                             |             |               |                |  |                                  |                 |
| NEWPOL LB-1800X  |   | ✓                          |                                 |                |                 | ✓        |                 |                     | ✓      |                  |                             |             |               |                |  |                                  |                 |
| NEWPOL LB-400XY  |   | ✓                          |                                 |                |                 | ✓        |                 |                     |        |                  |                             |             |               |                |  |                                  |                 |
| NEWPOL 50HB-55   |   |                            |                                 |                |                 |          |                 |                     |        |                  | ✓                           |             |               |                |  |                                  |                 |
| NEWPOL 50HB-260  |   |                            | ✓                               | ✓              |                 | ✓        | ✓               | ✓                   |        |                  | ✓                           |             |               |                |  | ✓                                |                 |
| NEWPOL 50HB-400  |   |                            | ✓                               | ✓              |                 | ✓        | ✓               |                     |        |                  | ✓                           |             |               |                |  |                                  |                 |
| NEWPOL 50HB-660  |   |                            | ✓                               | ✓              |                 | ✓        | ✓               |                     |        |                  | ✓                           |             |               |                | ✓  | ✓                                |                 |
| NEWPOL 50HB-2000 |   |                            | ✓                               |                |                 | ✓        |                 |                     | ✓      |                  | ✓                           |             |               |                | ✓  |                                  |                 |
| NEWPOL 50HB-5100 |   |                            |                                 |                |                 | ✓        |                 |                     |        |                  | ✓                           |             |               |                | ✓  | ✓                                |                 |
| NEWPOL 75H-90000 | ✓                                       |                            |                                 |                |                 |          |                 |                     | ✓      |                  |                             | ✓           | ✓             |                |  | ✓                                |                 |
| NEWPOL V-10-C    | ✓                                       |                            |                                 |                |                 |          |                 |                     |        |                  |                             |             | ✓             |                |  | ✓                                |                 |

## 2. Features and Practical Examples of Applications

Polyoxyalkylene glycol-type lubricants have the following useful features.

- Exhibit a high-viscosity index (VI) and a small viscosity variation caused by temperature.
- Exhibit excellent flowability at low temperatures because these products have a low-pour point
- Hardly produce sludge such as carbide.
- Have a low coefficient of friction and excellent pressure resistance, and excel in lubricating properties.
- Hardly hydrolyze even under acidic or alkaline conditions.
- Can be dissolved in fats and oils, toluene, benzene, morpholine, and some alcohols, ketones, glycol ethers or esters.
- Hardly erodes metals for practical purposes.

Features and practical examples are further explained below:

### 2-1) Hydraulic Fluids (water and glycol-type)

Almost all hydraulic fluids used in hydraulic equipment are types of mineral oils. However, these oils may cause fires when used near ignition resource because they are flammable.

In these situations, water-based hydraulic fluids should be used because they are non-flammable. Also, hydraulic fluids (water and glycol-type) containing one of polyoxyalkylene glycol-type lubricants, which are marked with ✓ in Table 3, can be used (these products impart adequate viscosity and a lubricating property to water).

In addition to being non-flammable, the hydraulic fluids (water and glycol-type) have some other desirable features such as a low-pour point, and a high VI. They also excel in shear stability and are not sticky.

### 2-2) High-temperature Lubricants

Using mineral oil-type lubricants at high temperatures is considered to be very difficult because the mineral oil carbonizes and produces sludge.

However, polyoxyalkylene glycol-type lubricants, which are marked with ✓ in Table 3, hardly oxidize or decompose even at high temperatures because they contain an antioxidant. These products prevent metal burn-out, etc. because the resulting by-products can be volatilized or dissolved in the lubricant even when oxidation and decomposition occur, and carbides and sludge are hardly produced.

Because of these features, these products are used as base oil in lubricants for gear chains, bearings, etc. in machines which operate at high temperatures for cement production, pottery production, glass making, plastics processing, etc.

### 2-3) Low-temperature Lubricating Oil

Polyoxyalkylene glycol-type lubricants, which are marked with ✓ in Table 3, exhibit a high VI and a small viscosity variation caused by temperature. Also, the pour point is low and these products do not contain wax. Therefore, even at low temperatures, these products exhibit excellent lubricating properties and they impart high start-up performance for machines.

Because of these features, these products are used as base oils for lubricating oils for machines used in cold situations such as hydraulic equipment, ice cream production equipment and electric motors.

#### 2-4) Compressor Oil and Vacuum Pump Oil

Polyoxyalkylene glycol-type lubricants, which are marked with ✓ in Table 3, impart a suitable viscosity property for compressor and vacuum pump oil, and the compatibility between these products and organic matter is high. The resulting oils are still efficient for lubrication even when used for a long duration because these products do not carbonize or become gum.

Because of these features, these products are used as base oils for gas compressor oils, vacuum pump oils, oils for refrigerating machines, compressor oils, etc.

#### 2-5) Gear Oil

Polyoxyalkylene glycol-type lubricants, which are marked with ✓ in Table 3, are suitable as base oils for gear oils due to their excellent low-temperature fluidity and lubricating properties such as oiliness, pressure resistance, wear resistance, etc.

#### 2-6) Hydraulic Fluids and Brake Fluids for Cars

Polyoxyalkylene glycol-type lubricants, which are marked with ✓ in Table 3, are suitable as base oils for hydraulic fluids because these products hardly corrode rubber and metals, exhibit extremely high pressure resistance, wear resistance and shear stability, and also excel at low-temperature fluidity.

Hydraulic fluids and brake fluids for cars are generally prepared by adding these products to a solvent, an oiliness improver, a rust preventive agent, antioxidant, etc.

#### 2-7) Grease

Polyoxyalkylene glycol-type lubricants, which are marked with ✓ in Table 3, are used as a base oil for grease because these products impart suitable viscosity properties for grease and also excel at the dispersibility of lubricating solids into grease.

For example, these products are added to grease in order to prepare lithium-soap grease blended with lithium soap or high-temperature grease blended with graphite and molybdenum sulfide.

#### 2-8) Engine Detergent

Polyoxyalkylene glycol-type lubricants, which are marked with ✓ in Table 3, are used as base materials for engine detergents which are added to fuel oils. These products are compatible with fuel oils such as gasoline, and they dissolve and can be removed sludge from inside the engine.

#### 2-9) Water-soluble Cutting Fluids

Polyoxyalkylene glycol-type lubricants, which are marked with ✓ in Table 3, are used as base materials for water-soluble cutting fluids (oil for grinding). These products exhibit an excellent lubricating property even under high loads and also produce less foam.

Suitable water-soluble cutting fluids for various metals are generally prepared when an oiliness agent, a rust preventive agent, an antiseptic, a chelating agent, etc. are added to the lubricant. The resulting oil excels in cooling capability, and hardly causes metal burn. The tool life is long, and metal surfaces of great precision can be finished.

#### 2-10) Drawing Oil

Polyoxyalkylene glycol-type lubricants, which are marked with ✓ in Table 3, are generally used as drawing oils. These products exhibit excellent lubricating properties even under high loads. Following drawing processes using these products, it is easy to remove them because they are water-soluble. In addition, using a mineral oil generates carbide, but carbide is not formed in the annealing process when one of these products are used.

#### 2-11) Quenching Oil

Polyoxyalkylene glycol-type lubricants, which are marked with ✓ in Table 3, can dissolve in water, and are used as water-soluble quenching oils because they are water-soluble and have suitable viscosity and cloud points to form thermal barrier films that control cooling rate after the quenching (at the temperature of cloud point or higher, those products become water-insoluble and separate from water).

#### 2-12) Heating Medium

Polyoxyalkylene glycol-type lubricants, which are marked with ✓ in Table 3, are suitable as a heating medium. These products have some benefits such as an extremely low vapor pressure, a high VI, and the small viscosity variation caused by temperature. The surface of the heater does not get dirty because sludge is not formed.

#### 2-13) Mold-releasing Agents for Resins and Rubber

Polyoxyalkylene glycol-type lubricants, which are marked with ✓ in Table 3, are used not only as anti-tack agents but also as mold-releasing agents because these products exert practically no detrimental influence on natural rubber, synthetic rubber, urethane rubber, etc. Moreover, these products are able to withstand vulcanizing temperature well, and do not become sticky.

Generally, these products are prepared for coating mold surface after diluting them with a solvent or water and they are used as internal mold release agents by adding to rubber, etc.

#### 2-14) Lubricants for Textile Industries

Polyoxyalkylene glycol-type lubricants, which are marked with ✓ in Table 3, are used as base materials for spinning oils, etc. These products excel in lubricating properties for textile fibers, and it is easy to dilute them and remove them because they are water-soluble. Moreover, they hardly form tar and hardly turn yellow during heat treatment processes for fibers such as drawing and/or heating set processes.

#### 2-15) Defoaming Agent

Polyoxyalkylene glycol-type lubricants, which are marked with ✓ in Table 3, are used as defoaming agents (for lubricating oils, a service water of boilers, antifreeze solution, latex paint, etc.) and a foam inhibitor for liquid detergent.

## 2-16) Others

Polyoxyalkylene glycol-type lubricants, which are marked with ✓ in Table 3, are used for various applications of lubrication by making good use of some features which mineral oil does not have. In addition to the application to lubrication, these products can be used as solvents (for ink and dye), diluent, softener (for leather and paper), plasticizer of resins, fiber-finishing agents, surfactant and as base materials for medical drugs (such as ointments).

### Important :

Before handling these products, refer to the Safety Data Sheet for recommended protective equipment, and detailed precautionary and hazards information.

---

*This brochure has been prepared solely for information purposes. Sanyo Chemical Industries, Ltd. extends no warranties and makes no representations as to the accuracy or completeness of the information contained herein, and assumes no responsibility regarding the suitability of this information for any intended purposes or for any consequences of using this information. Any product information in this brochure is without obligation and commitment, and is subject to change at any time without prior notice. Consequently anyone acting on information contained in this brochure does so entirely at his/her own risk. In particular, final determination of suitability of any material described in this brochure, including patent liability for intended applications, is the sole responsibility of the user. Such materials may present unknown health hazards and should be used with caution. Although certain hazards may be described in this brochure, Sanyo Chemical Industries, Ltd. cannot guarantee that these are the only hazards that exist.*

---

For detailed information, please contact below.

Head Office & Research Laboratory of Sanyo Chemical Industries, Ltd.

Address: 11-1, Ikkyo Nomoto-cho, Higashiyama-ku, Kyoto 605-0995, Japan

Tel: +81-75-541-4311 Fax: +81-75-551-2557



Tokyo Branch Office of Sanyo Chemical Industries, Ltd.

E-mail: [sanyoproduct@sanyo-chemical.group](mailto:sanyoproduct@sanyo-chemical.group)

Address: 24th Fl., Hibiya Fort Tower, 1-1-1, Nishi-shimbashi, Minato-ku, Tokyo 105-0003, Japan

Tel: +81-3-3500-3411 Fax: +81-3-3500-3412

URL <https://www.sanyo-chemical.co.jp/eng>

---

B032305