

VISCOPLEX® 4-477

A Very Shear-Stable Highly Concentrated VI Improver

A RohMax Product



Function

VISCOPLEX® 4-477 is a multifunctional engine oil additive combining the functions of viscosity index improver (VII) and pour point depressant (PPD).

Performance

This product is designed to formulate multigrade gasoline and diesel engine oils meeting the most stringent specifications set by API, ACEA, and OEMs. It is particularly useful to blenders located in remote areas or where climatic conditions require the use of polymers with outstanding handling properties.

Composition

VISCOPLEX® 4-477 is a highly concentrated unique low-viscosity emulsion based on ethylene and propylene copolymer in a carrier fluid.

Physical Data

Table 1 lists representative physical properties. (These do not constitute specifications.)

VISCOPLEX® Series 4 Engine Oil Viscosity Index Improvers

Table 1

Typical Physical Properties of VISCOPLEX® 4-477

Visual Appearance	Turbid
Color (visual)	Brown
Viscosity at 40 °C, mm ² /s (ASTM D445)	6,500
Density at 15 °C, g/cm ³ (ASTM D4052)	0.90
Flash Point, °C (ASTM D3278)	>120
Shear Stability Index (PSSI) (ASTM D6278)	20

Density

The typical density of VISCOPLEX® 4-477, as a function of temperature, is given in Figure 1.

Bulk Viscosity

The typical bulk viscosity of VISCOPLEX® 4-477, as a function of temperature, is given in Figure 2. As an emulsion, VISCOPLEX® 4-477 behaves different from a homogenous polymer solution. When heated above 100 °C, its viscosity increases. Therefore it is not recommended to heat the product above 100 °C.

Storage Life and Transfer Temperature

Like all emulsions, VISCOPLEX® 4-477 has a finite storage life if storage recommendations are not followed.

- Bulk Storage
In the absence of circulation or agitation, storage stability is guaranteed for a minimum of one year. If VISCOPLEX® 4-477 can be circulated or agitated at least once every 6 months, it will remain homogenous for several years. Ideally, the bulk storage tank should be fitted with a circulation system.
- Drum Storage
The minimum storage time for drummed material is one year, if the drums are not moved. VISCOPLEX® 4-477 is a free-flowing fluid even at room temperature. Heating is thus generally unnecessary, if stored at temperatures higher than 20 °C.
- Maximum temperatures
Short-term storage and transfer: 100 °C
Long-term storage: 80 °C

Figure 1 Density vs. Temperature

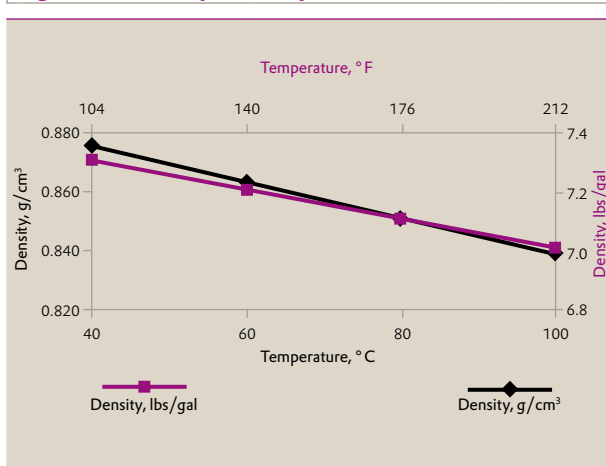
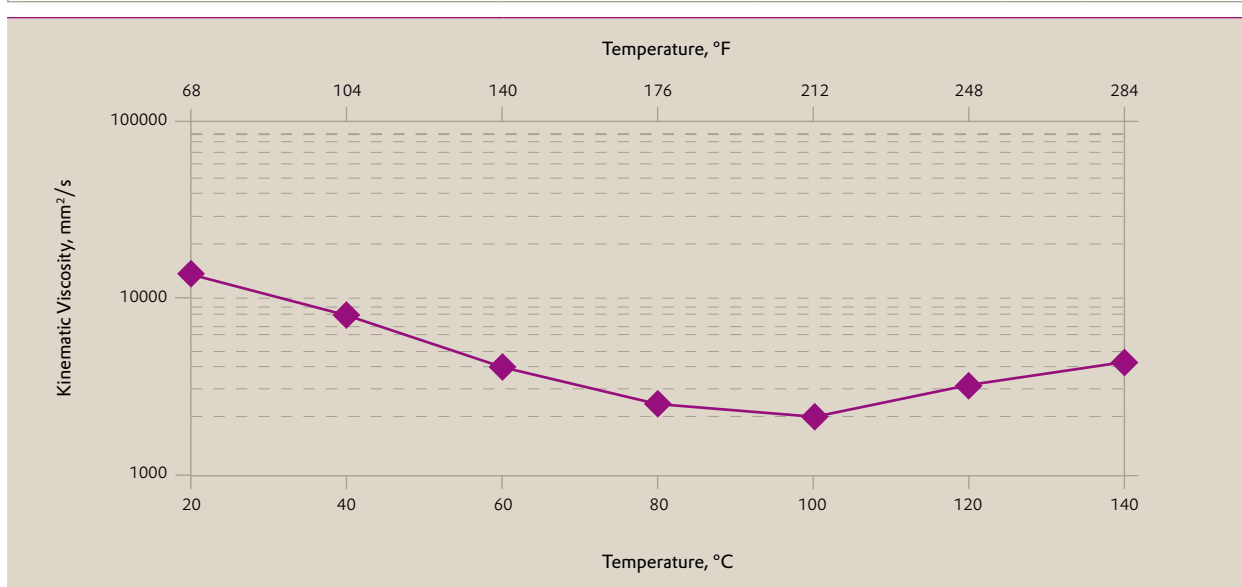


Figure 2 Kinematic Viscosity vs. Temperature



Recommended Blending Procedure

Equipment:

Blending equipment requires a tank with an agitator and heating capability to 100 °C. A high shear circulation loop may be used to reduce blending time. Typical total blending times are 2 to 6 hours depending on temperature and quality of agitation.

Tank height to tank diameter ratio:

$$h_T/d_T = 1 - 2$$

Top entry turbine agitator with agitator diameter to tank diameter:

$$d_A/d_T = 0.2 - 0.5$$

Process steps:

1. Charge 30-50% of the base oil.
Agitator should be well covered with oil.
2. Heat to approximately 90 °C and agitate.
3. Charge VISCOPLEX® 4-477 into tank. Charge slowly into a central part of the tank close to the agitator or directly into the suction side of the circulation loop pump.
4. Blend using agitation and circulation loop for 2 to 4 hours.
5. Sample for visual appearance (homogeneity).
6. Add remaining oil.
7. Agitate for 1 to 2 hours.
8. Sample for viscometric properties.
9. Add DI Package or any other required component at the temperature recommended by the supplier.

The above mentioned procedure describes a process for typical blending equipment. Variations in the layout of the blending equipment may affect above stated blending times.

Additional Information

For additional information on product availability, performance data and Material Safety Data Sheets, please contact your RohMax account manager or Customer Service Representative.

For an overview of our entire VISCOPLEX® and VISCOBASE® product range and complete information on handling and storage, please visit the Products & Applications section on our website www.rohmax.com.

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