VISGAGE©

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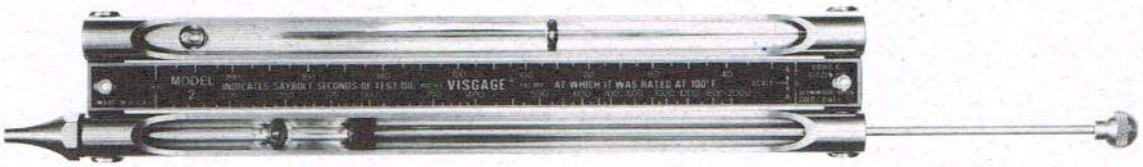


THE VISGAGE: A POCKET VISCOSITY COMPARATOR

Quickly and **conveniently**, the VISGAGE checks oil viscosity on-site; without thermometers or stop watches. The VISGAGE can be used to check any oil from a light spindle oil to heavy gear oils. Regular users of the VISGAGE include nearly every type of industry in the world, ie. railroads, truck and bus lines, marine fleets, power plants, laboratories, oil distributors, etc. The VISGAGE is probably the most useful instrument ever devised to aid in a used-oil analysis program. Quality control can be assured when the VISGAGE is regularly utilized to verify oil viscosities.

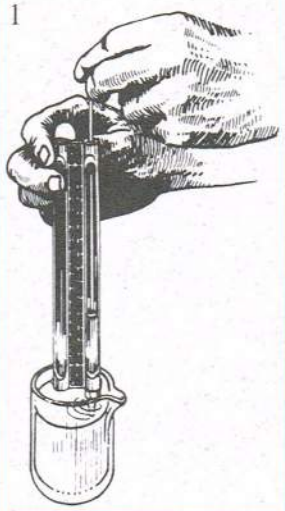
ANY COMPANY USING QUANTITIES OF LUBRICATING OILS, TURBINE OILS OR HYDRAULIC OILS, SHOULD HAVE A VISGAGE.

The principle of operation is simple. It is based on comparing the viscosity of a sample of oil with an oil of known viscosity. The viscosity reading is made directly in Saybolt Universal Seconds at 100°F at room temperature (80°F). **No calculations are necessary**. An accuracy of 95% or better is easily achieved when making tests. Careful operators can obtain excellent results. The VISGAGE is more widely used throughout the world than any other type of viscometer, for two very good reasons; **better accuracy and easier operation**. Operators in the field can consistently test as accurately and faster than most commercial laboratories. The use of the VISGAGE is ideal for obtaining immediate test results.

Please read instructions carefully before using VISGAGE.

MODEL 2 & MODEL 4 OPERATING INSTRUCTIONS

1



HOW TO FILL THE TEST TUBE:

CAUTION: *Do not draw hot oils directly from a crankcase or reservoir into the VISGAGE.*

Place a small quantity of oil into a container (Fig. 1), then insert nozzle of VISGAGE into this oil (fluid) when temperature is approximately 80°F (27°C).

Best results are achieved when tests are made at 80°F (27°C).

After inserting nozzle in oil to be tested, slowly withdraw plunger (Fig. 1). If an air bubble appears in the test tube, invert the VISGAGE (Fig. 2) and discharge the air with a small amount of oil. Insert nozzle in oil, slowly withdraw the plunger and completely fill the test tube with oil, free of air bubbles. (See back page for instrument description)

2

HOW TO PLACE VISGAGE IN DRAFTPROOF CASE:

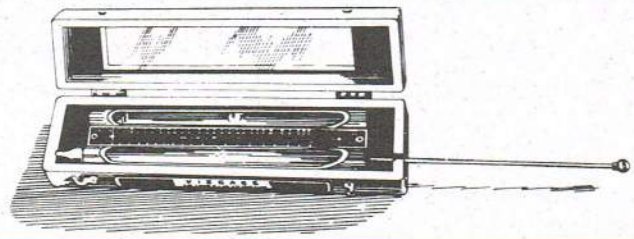
Adjust the plunger to position ball in test tube at 0 SUS line (Fig. 3). Position VISGAGE in draftproof case with plunger rod extending through slot at right side of case (Fig. 4). *Close and lock cover. Allow the oils to attain the same temperature.*

READING:

Hold the case with VISGAGE in horizontal position at eye level, fifteen inches away, with scale in upright position (Fig. 3). Instrument will be facing you with reference tube over plunger tube. With both balls on zero line, tilt instrument with nozzle end down (Fig. 5) to an angle between 30 and 45 degrees so balls move through the oils toward the line at left side of scale. (To develop your proficiency and to determine best angle of tilt, make VISGAGE tests using a standard fluid of known viscosity.) Give balls the run of the oils. As the leading ball approaches the line at the left of scale (200/400 SUS line), gradually move the instrument to horizontal position to stop leading ball exactly on the line. The point on the scale of the lagging ball indicates the viscosity of the tested oil directly in Saybolt Universal Seconds at 100°F. After a few trials, any operator can check the viscosity of oils to an accuracy of 95% or better; and if skillful, to even closer accuracies.

3

4



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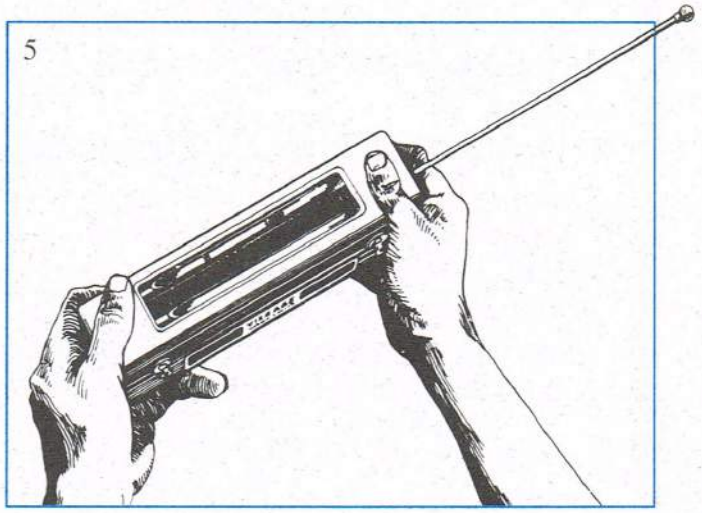


HOW TO BE CERTAIN THAT OILS ARE THE SAME TEMPERATURE:

Slowly raise plunger end of VISGAGE to an angle between 30 to 45 degrees. Take two or three readings. If readings repeat, the oils are the same temperature. If readings do not repeat, allow another few minutes to equalize temperature until a few readings repeat. The final repeat reading indicates the viscosity of the test oil directly in Saybolt Universal Seconds at 100°F.

HOT OILS:

WARNING: *Do not immerse VISGAGE in hot oil or hot water to equalize temperatures. Do not heat VISGAGE above 100°F (see "Heating the VISGAGE" on back page).*

CLEANING:

The VISGAGE is self cleaning. When the oil is discharged after a test, the wall of the test tube is effectively cleaned by returning the plunger to its original position. A small amount of oil will remain in the bore of the nozzle. To discharge this, fill the test tube with the next oil to be tested, discharge and discard it. This will clean the nozzle of the previous oil before the new test is made.

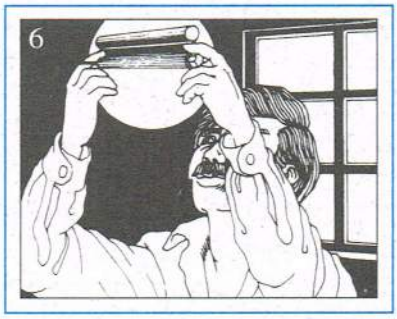
Non-use of the VISGAGE over a period of time with residue oil in the test tube may gum the ball and the wall of the tube. To remove gum, draw into the test tube a few charges of light oil or kerosene to dissolve the residue. *Do not use straight gasoline or naptha.*

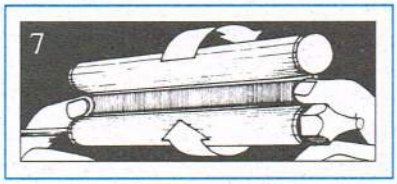
DARK COLORED OILS:

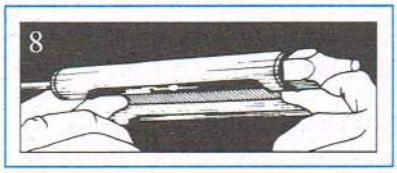
Dark colored oils in the test tube may make it difficult to see the ball. To overcome this, follow standard test procedure under **READING**. Then, with your back to the light (Fig. 6) and full light on the scale, (Fig. 7 & 8) tilt reference tube toward you 90 degrees to bring the ball in the test tube into sight. The point on the scale corresponding to the position of the ball indicates the viscosity of the test oil direct at which it was rated in Saybolt Universal Seconds at 100°F (Fig. 8).

The VISGAGE is designed and constructed to test the viscosity of new and used oils ***but not sludge or crude.***

Whenever the ball in the test tube can no longer be seen, you will know the oil is so badly fouled with contaminants that it needs to be changed immediately or cleaned by any of the appropriate cleaning methods.







VISCOSITY INDEX (VI):

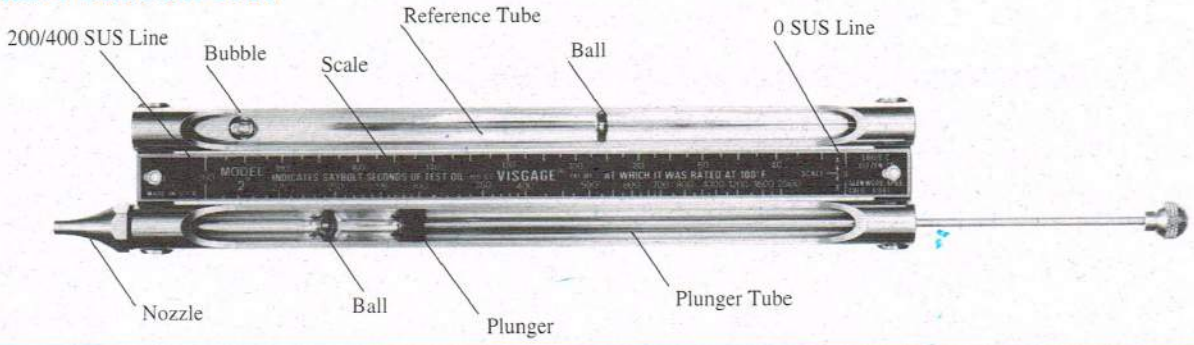
The reference tube contains certified oil with a viscosity index of 95 VI. Best accuracy is achieved when the oil being tested has a VI near the VI of the reference oil, and several identical readings on the scale indicate temperatures of both tubes are equal. If the VI's of the oils are far apart (for example, 95 VI in reference tube, 40 VI in test oil), warm VISGAGE to 100°F, and then take readings.

MODEL #2	MODEL #4
SCALE RANGE - 0 TO 2000 SUS @ 100°F. Recommended range for readings approximately 40 to 800 SUS	SCALE RANGE - 0 TO 2000 SUS @ 100°F. Recommended range for readings approximately 400 to 1400 SUS

MODEL 2

MODEL 4

INSTRUMENT DESCRIPTION



HEATING THE VISGAGE:

The temperature of both the reference tube and the drawn oil must be the same before taking a reading. Certain oils may require heating the instrument to 100°F to obtain accurate results.

Place the VISGAGE in its draftproof case with a thermometer under a lamp. Test your oil viscosity when temperature reaches 100°F. **The VISGAGE should NOT be heated over 100°F.**

OVER-HEATING WILL CAUSE THE VISGAGE TO GO OUT OF CALIBRATION.

Reference tube oils are sealed with a small bubble to allow for expansion. Overheating the oil will rupture the seals of the reference tube.

Hot oil drawn from a crankcase or reservoir must first be cooled in a separate container before testing the oil with the VISGAGE.

The VISGAGE is calibrated at 80°F.

ATTENTION OPERATORS:

Develop your proficiency by first practicing with oils of a known viscosity. A standardized testing procedure and an angle between 30 and 45 degrees will then be established.

Oils lighter than the reference tube oil are easy to test. Stop the faster ball at the 200/400 SUS line. The ball in the heavier oil will then mark your viscosity.

REPAIRS: *If instrument is damaged, pack carefully in carton with shredded paper to prevent further damage and return to us for repair, reconditioning and recalibration at prevailing charge.*

Every VISGAGE is constructed for portability and utility and is assembled and calibrated before leaving the laboratory. Do not disturb either glass tube. The VISGAGE is sensitive to shock and, like a thermometer, must be handled with care.

WE CANNOT BE RESPONSIBLE FOR THE CALIBRATION OF THE VISGAGE IF PARTS ARE REMOVED AND REPLACED BY YOU.

SPECIAL MODELS AVAILABLE. **WRITE FOR FURTHER INFORMATION.**

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