

## Frequently Asked Questions – Automotive Refractometers

### *What is a Refractometer and how is it used?*

A Refractometer is an optical device that measures how light passes through a sample of coolant to determine its concentration and freeze point. The operator places a small amount of coolant on the prism and, through the viewfinder, reads the measurement on a scale. A Refractometer accurately measures both ethylene and propylene glycol-based coolants to within  $\pm 1^\circ$ .

### *Why is a Refractometer better for this purpose than other measuring devices?*

A Refractometer offers extreme accuracy that cannot be duplicated by a hydrometer. Hydrometers come in 3 basic styles (floating disc, floating ball and needle type) and all measure the specific gravity of ethylene glycol-based coolants. Hydrometers are popular primarily for their low cost and ability to offer a visual inspection of the coolant. But, hydrometers are notoriously inaccurate (up to  $23^\circ$  off in lab testing) and require some technical expertise to operate. Hydrometer readings can be affected by air bubbles, the angle of the tester during inspection and by the ambient temperature. Specific gravity changes with temperature and requires the operator to compensate for temperature in order to obtain an accurate reading.

### *How can a technician benefit by using a Refractometer?*

The Refractometer is a professional tool capable of providing highly accurate readings, ensuring that a proper check of a vehicle's coolant can be performed. Maintaining a proper coolant mixture will ensure longer service life for the coolant and the vehicle, particularly when cooling system issues are cited as the number one cause of roadside breakdowns. Recent Car Care Awareness inspections have found that up to 35% of vehicles inspected had an improper coolant level, improper coolant mixture or coolant leaks, pointing to the need for proper cooling system maintenance and repair.

### *Are all Refractometers the same?*

NO! The biggest difference between Refractometers is whether or not they feature Automatic Temperature Compensation (ATC). ATC eliminates the need for a technician to compensate the sample readings with the ambient air temperature each time the tool is used, without which the readings would be inaccurate. All **VIPER** Refractometers feature ATC for superior reliability and ease of use, though many other Refractometers do not.

### *What do OEMs say about the use of a Refractometer?*

Most OEMs (including heavy duty manufacturers) specify the use of a Refractometer for accurate coolant measurement. Today's complex engine management systems require specific operating temperatures and improperly mixed coolant can result in over-heating or freeze-up. With increased use of long-life coolant, proper coolant mixtures are a must for warranty and extended service intervals. OEMs specify Refractometer use because no other tool can offer its level of testing accuracy.



The **VIPER** Refractometer, Part No. 5026, features Automatic Temperature Compensation, dual scales for ethylene glycol and propylene glycol, a high contrast lens for easy viewing and a rugged steel body construction for durability.

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