

Phase GPA 70Xi Antifreeze analyzer for coolants

- Only automatic analyzer for engine coolants
- ASTM D6660
- ASTM D1177



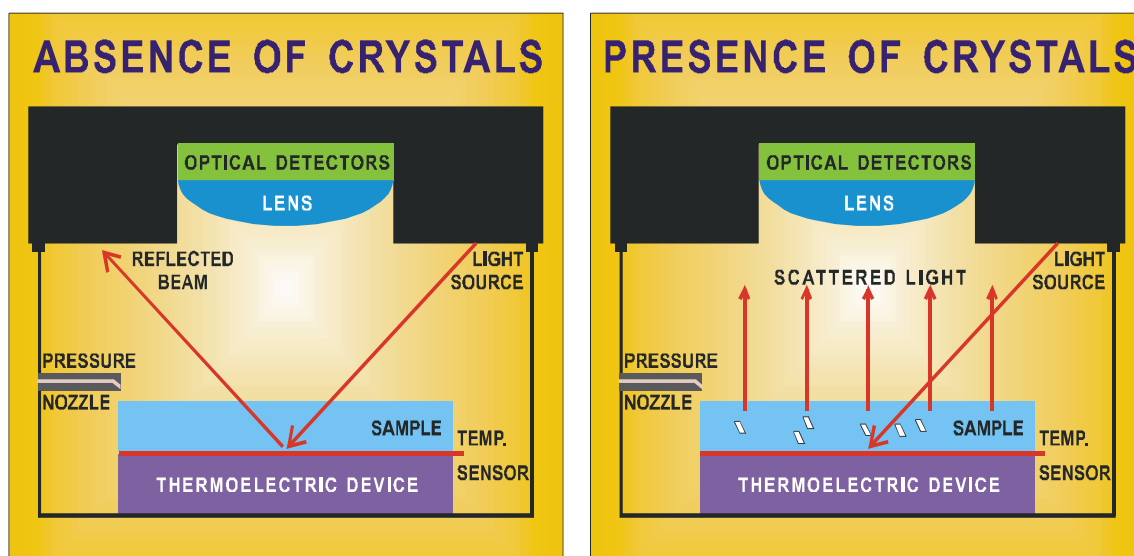
Keywords: Antifreeze, Coolant, ASTM D6660, ASTM D1177

Introduction:

Phase Technology leads the industry with the world's first and only automatic freeze point analyzer for engine coolants. Scientists at Phase Technology have dedicated many years of research in the low temperature phase transition behavior of materials. Their expertise, in combination with the latest advances in electronic and cooler designs, has led to patented technologies that measure the freeze point of engine coolant precisely.

These unique proprietary technologies offer distinct advantages over other methods in terms of precision, speed, reliability, compactness, and ultralow sample temperatures. The methodology was adopted by ASTM D6660 and approved as an alternate test method to the manual ASTM D1177 in coolant specifications for light and heavy-duty vehicles such as ASTM D3306, D4985, GM6277M and Ford WSE-M97B44-B.

Phase Technology's 70Xi analyzer performs a freezing point test by first cooling the sample at a prescribed rate as the optics system looks for crystal formation. Once they are formed, the sample is warmed at a specified rate until the crystals start to melt and return to the liquid phase. The analyzer determines and reports the freezing point to be the temperature at which the crystals melt during this solid-liquid transition phase.

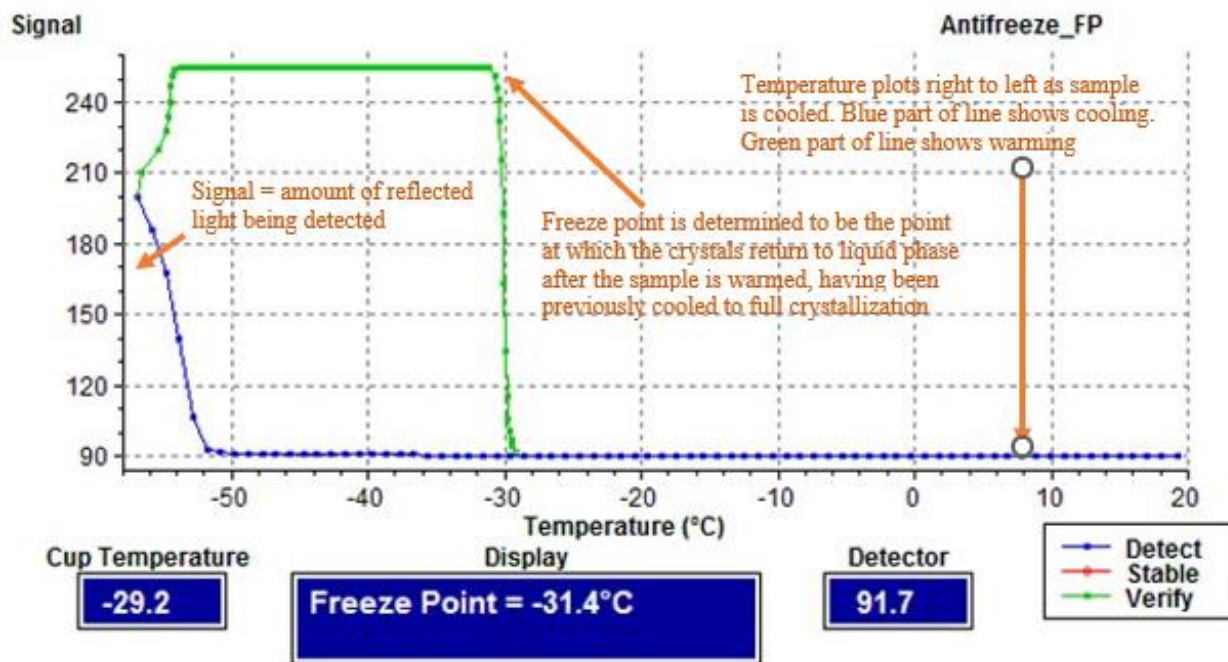


Results

Phase Technology's 70Xi significantly increases lab productivity and improves profitability by providing quick, precise results.

Results are displayed in real-time test. The phase plot shows temperature change and signal strength as test progresses. The graphic visual information helps users better understand anomalous behavior.

For freezing point tests, phase plots depict the optics signal maintaining a low and flat baseline level when the sample is completely liquid at warm temperature. The signal rises and crystals form when the sample is cooled, then the signal returns to baseline level when the sample is warmed.



During our study the unit has been tested with known concentrations of Ethylene-Glycol / water mixtures. Different concentration levels have been used to validate the performance of the instrument.

Observed linearity is shown in the table below:

Glycol % by volume	Expected Freeze point in °C	Observed Freeze point in °C
12,5 %	-4 °C	-3,9 °C
		-4,1 °C
		-4,1 °C
17 %	-7 °C	-7,0 °C
		-6,5 °C
		-6,5 °C
25 %	-12 °C	-11,9 °C
		-11,8 °C
		-11,8 °C
32,5 %	-18 °C	-18,6 °C
		-18,4 °C
		-18,9 °C
38,5 %	-23 °C	-22,7 °C
		-22,5 °C
		-23,0 °C
44 %	-29 °C	-29,0 °C
		-29,0 °C
		-29,0 °C
49 %	-34 °C	-34,7 °C
		-34,7 °C
		-34,7 °C
52,5 %	-40 °C	-39,5 °C
		-39,2 °C
		-39,4 °C

Conclusion

Coolant manufacturers, packagers, research and inspection laboratories, government agencies and many other facilities derive significant benefits from using Phase Technology's freeze point analyzers. In comparison with the manual D1177 method, the analysis time is reduced to less than 10 minutes while precision is significantly improved. For the user this means a much higher sample throughput and a faster response to their specific requests.