ThermOmegaTech®

EFFECT OF EXTREME COLD ON THE GURU®

LOW TEMPERATURE TEST RESULTS OF THE GURU® DL 2.1 IN -60°F CONDITIONS

THE STUDY

On January 6, 2020, ThermOmegaTech® conducted an environmental exposure test to determine if extremely cold air temperatures could cause the GURU® Plug to nuisance dump when engine coolant water temperature is above the valve's release set-point.

The test was performed at ThermOmegaTech®'s Warminster, Pennsylvania headquarters in an on-site lab and was supervised by a qualified design engineer.

CONDITIONS

A GURU® DL 2.1 Type-T valve was installed in a Tenny Environmental Chamber® and exposed to 3MPH winds at -60°F (-51.1°C) in an attempt to trigger a nuisance dump.

To simulate engine coolant, the test was conducted with 55°F (12.7°C) water flowing through the valve tee at 1GPM. Coolant temperature was monitored at the inlet and outlet of the environmental chamber and flow was adjusted to keep the inlet and outlet temperatures relatively consistent at 55°F (12.7°C).

To ensure environmental conditions were constant throughout the test, the temperature chamber door remained closed. To accurately determine if a valve release occurred, a leakSMART® sensor was placed inside of the chamber underneath the GURU® Plug.

Figure 1. *GURU® DL 2.1 Low Temp Test Set Up*

Figure 2. *Environmental Chamber Settings*

CONCLUSION

After two hours of exposure, the GURU® remained closed. There were no instances of nuisance dumping above the GURU® Plug's set-point due to the extreme cold air temperature or wind exposure.

This test confirmed that 55°F (12.7°C) engine coolant flowing at 1GPM will provide sufficient heat/energy for the GURU® DL 2.1 to remain closed despite environmental conditions. The test also confirmed the benefits of sensing the coolant fluid's temperature, compared to sensing the ambient air temperature. Due to the GURU®'s fluid-sensing design, it is able to operate in environments where ambient sensing products cannot.

The test results were verified by removing the 55°F (12.7°C) coolant flow, leading the GURU® to release.

Coolant Inlet Temp (°F)	Coolant Outlet Temp (°F)	Tenney Chamber Temp (°F)	Chamber Wind Velocity (MPH)	Coolant Flow Rate (GPM)	Result
55	55	-60	3	3	Closed
55	55	-60	3	0	Open

Table 1. *GURU® DL 2.1 Low Temp Test Results*