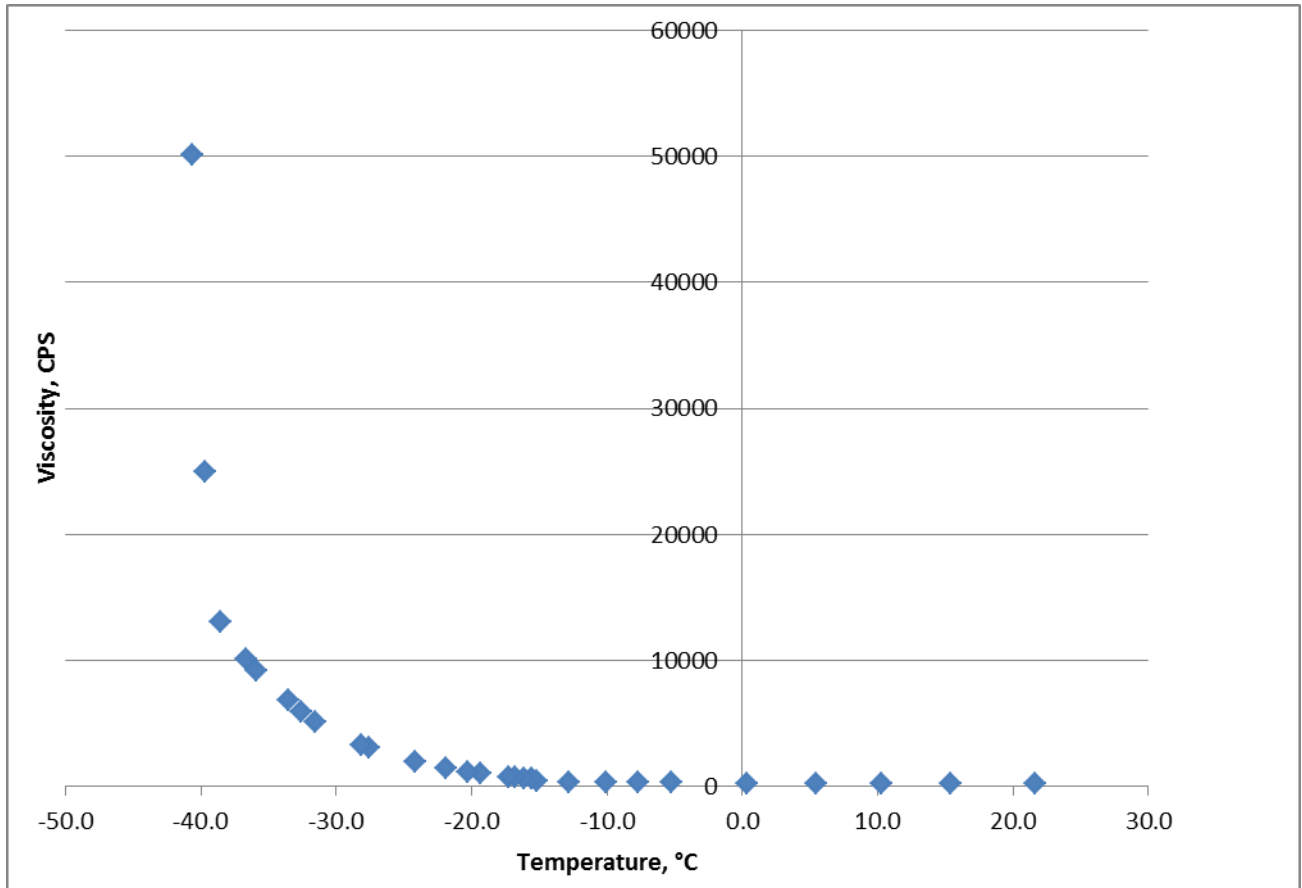


Report to: David Gorrell QA Director Everkem Diversified Products 5180 Indiana Avenue, Winston-Salem, NC 27106 dgorrell@everkemproducts.com	Certificate of Analysis #100309a Date of Report: 24 January 2014
Sample Information:	Cold Weather Wire Pulling Lubricant, Everkem Diversified Products

Method: Dynamic viscosity versus temperature test down to -60 °C

Results:

Temperature (°C)	Viscosity (CPS)
21.6	220
15.4	220
10.3	220
5.5	238
0.4	260
-5.2	296
-7.7	312
-10.1	338
-12.8	366
-15.2	426
-15.5	628
-16.2	680
-16.8	740
-17.2	778
-19.3	1020
-20.2	1150
-21.9	1420
-24.2	2015
-27.5	3120
-28.1	3250
-31.6	5102
-32.6	5907
-33.6	6820
-35.9	9211
-36.6	10108
-38.5	13023
-39.7	25020
-40.6	50174



Viscosity over temperature plot

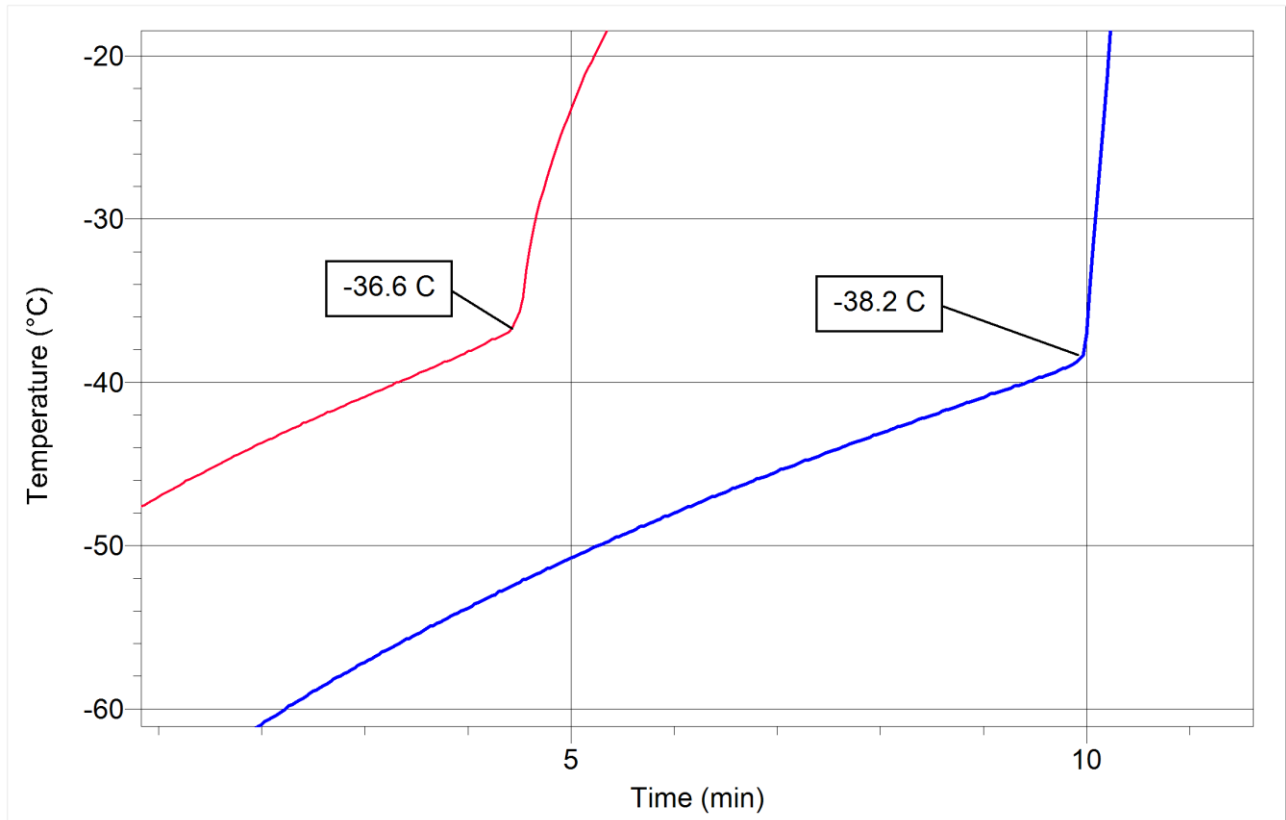
The test performed with digital brookfield viscometer equipped with cryogenic chamber.

Conclusion: the viscosity of the sample gradually rises while sample is being frozen below -10 °C and becomes solid below -40 °C.

Method: Melting point test by mechanical separation of frozen-in temperature sensor.

In this test a platinum temperature sensor was frozen inside of the sample (to $-95\text{ }^{\circ}\text{C}$) and then the temperature of the sample was elevated. A specified mechanical force was applied to the frozen sample against the temperature sensor, so the temperature sensor is extracted by this force from the sample as soon as the sample reaches a “thawing” point. This causes bending of recorded temperature curve.

Results:



Thawing curves (red – 0.2 N force; blue – 5.0 N force)

Result: the mechanical movement of the frozen sample begins in the range of -38.2 to $-36.6\text{ }^{\circ}\text{C}$, depending of the applied force.

Authorized signature:

Oleg Nepotchatykh, Ph.D., MCIC

