

Evaluation of the Flow Properties of Greases at Extreme Low Temperatures



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Intro:

When working with industrial machinery, it is essential that all motile components stay properly lubricated, which is especially true when in extreme cold temperatures up to -30°C . At low temperatures, the base oil that composes certain greases can start to crystallize, causing the grease to lose its lubrication properties and can lead to equipment damage. Base oils, such as mineral oil, ester oil or silicone oil, determines the grease's viscosity and lubrication properties, which can change based on the operating temperatures. Understanding the flow properties and performance at extreme low temperatures is important for determining their proper application.

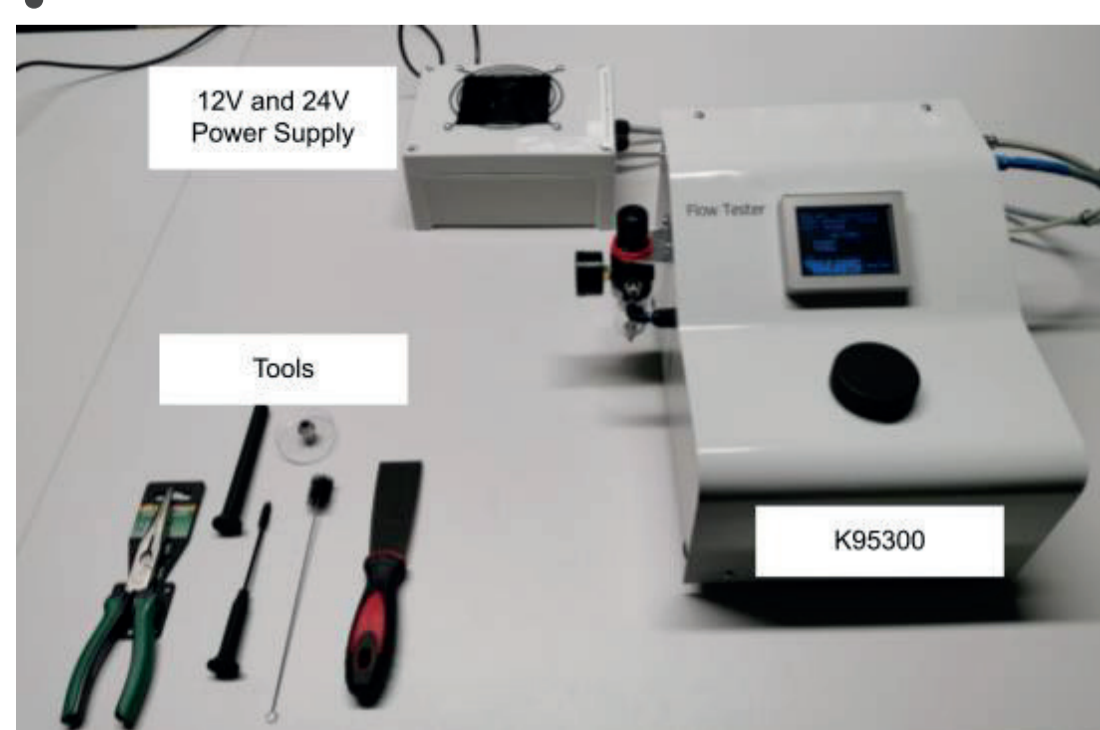
Our Solution:

At Koehler Instruments Company, our company has developed the K95300, to study the properties of greases at those low temperatures. The K95300 uses a method known as the Kesternich Method (DIN-51805) to evaluate the properties of the grease at the extremely cold temperatures. The K95300 can test greases at temperatures down to -50°C . To ensure the highest accuracy and precision in the results, the main parts of the K95300 are designed in compliance with medical standards.

Features and Specifications:

- Specifications: DIN-51805
- Operating Pressure range: 0 - 3 mBar
- Resolution: < 1 mBar
- Operating Temperature Range: -50°C to surrounding temperature
- Temperature Accuracy: $< 1^{\circ}\text{C}$
- Programmable Logic Controller (PLC): Touch PLC
- Electrical Characteristics:
 - 110 - 230 V
 - 50 - 60 Hz
 - Max Power: 350 Watts

Accessories and Included Parts:



- Pilers
- Spatula
- Cleaning Brush
- Nozzle
- Unloading Containers
- Power Supply

K95300:

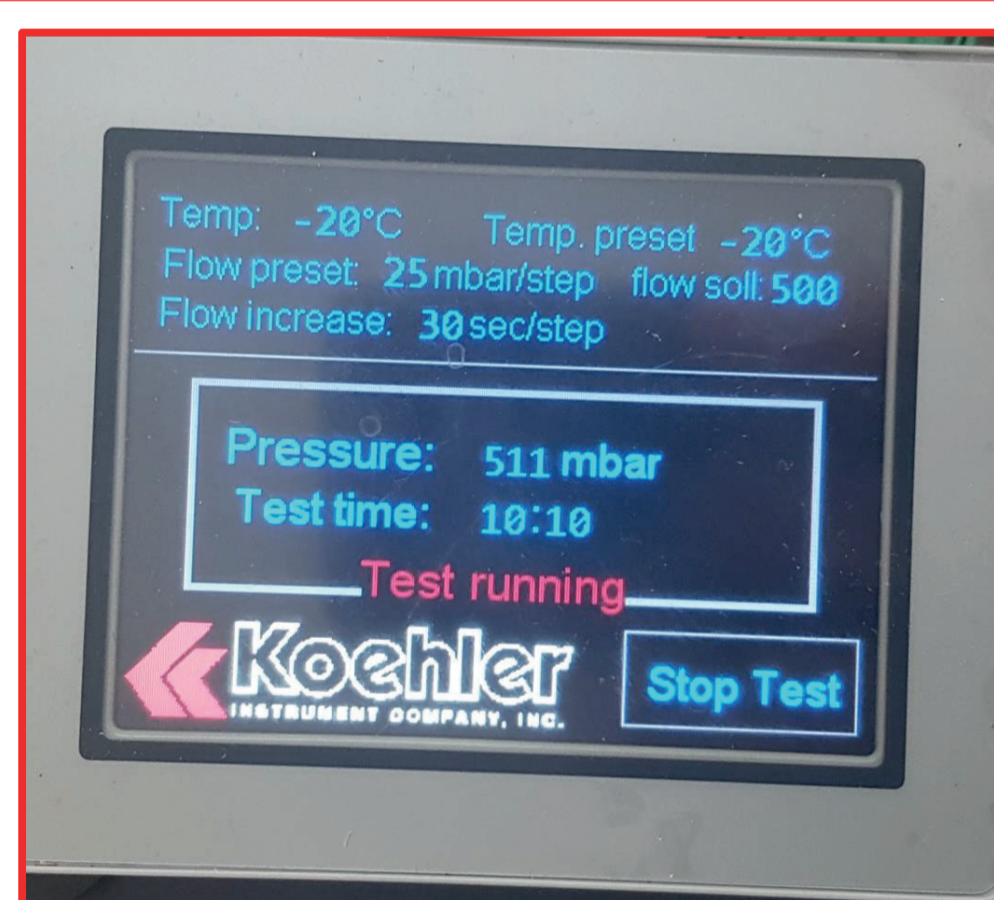


How The K95300 Works:

1. To start off the test, the user will take the nozzle and put a small sample of grease into the nozzle:



3. On the touch screen, select the option to perform the Kesternich Test and then select the pressure per time interval and then temperature desired. From that the test can start:



Kesternich Method (DIN-51805):

The Kesternich Method is a method used for testing the flow properties of greases at low temperatures. The test requires about 2 grams of grease, which is packed into a nozzle. Then the grease is cooled down to a temperature that is set by the user. After that, air is pumped in on one side of the nozzle in intervals, pressurizing one side of the nozzle. At a certain pressure the grease will squeeze out of the nozzle. The instrument will take note of that pressure and displayed it on the screen of the K95300, concluding the test.

2. After putting all of the grease that can fit into the nozzle, take the nozzle and place it into the apparatus and screw in the lid:



4. Once the grease has been squeezed out, there will be a pressure drop and the machine will display the pressure and offer to end the test or save the results to a USB flash drive:



Conclusion:

The K95300 was designed to be able to evaluate how greases perform at very low temperatures. Certain kinds of greases lose flow characteristics at low temperatures. Greases are composed of a base oil, which determines their lubrication properties and that can change depending on the operating conditions. At specific low temperatures, certain base oils will experience crystallization or an increase in its viscosity. Consequently, the grease will start to fail at providing adequate lubrication and protection to motile components, leading to equipment damage. Understanding the properties of grease in cold environments is important for determining the greases proper application and performance under frigid conditions. The K95300 is a simple and intuitive instrument for acquiring data about the low temperature flow properties in an accurate and precise manner.