

Design and Development for a New ASTM Test Technique to Study Fuel Corrosion

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Overview

Corrosion is a major issue when it comes to storing or transporting petroleum products such as fuels and oils. The damaging of the pipeline or container can cause unwanted expenses. By performing Accelerated Iron Corrosion Test (AICT), the degree of corrosion for a petroleum product can be obtained. Utilizing instrumentation, such as Koehler Instrument Company's K30269 Accelerated Iron Corrosion Tester, has proven to assist in preventing corrosion.

How Our Instrument Works

The K30269 instrument is a fully automatic test system that can provide AICT results quickly and accurately. The instrument is programmed to run in accordance with ASTM D7548 with the option to select default or custom parameters manually.



1 Prior to running a test, check all the testing setting. The default setting is for ASTM D7548 method or use custom parameters.



2 Label each of the sample as well as the operator's name. In addition, input the file number for the test run.



3 After pour 50 mL of sample into the test jar and start the test, the sample will be stirred at 900 RPM for 1 hour under default.



4 Once the test begins, the instrument will increase both bath and sample temperatures with certain amount of time to the desirable temperature.



5 After the test is done, take out the testing rod from the sample and compare to the standard result.

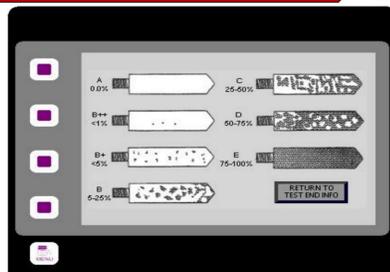
Koehler
INSTRUMENT COMPANY, INC.



Main Screen



Standard Test Rod Result Screen



What is the ASTM D7548 Method?

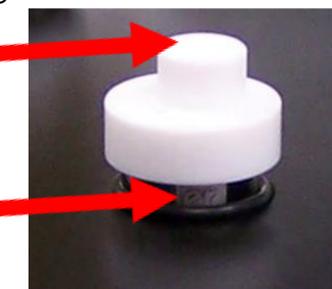
The latest ASTM Method (ASTM D7548) is a test method that tests accelerated iron corrosion of a liquid mixture. To perform ASTM D7548, the test rod is partially immersed in a sample liquid mixture. Then the sample liquid mixture will be stirred at 900 RMB for an hour under 38°C. Only 50 mL of the sample is needed to start the testing. The degree of corrosion can be obtained by comparing the test rod with the image of standard test rod result.

Preparation

Test rod, test jar, and stirring bar must all be polished prior to running a test. Pour the sample into the testing jar and put the testing rod back into the testing jar. There are four testing sites in total.

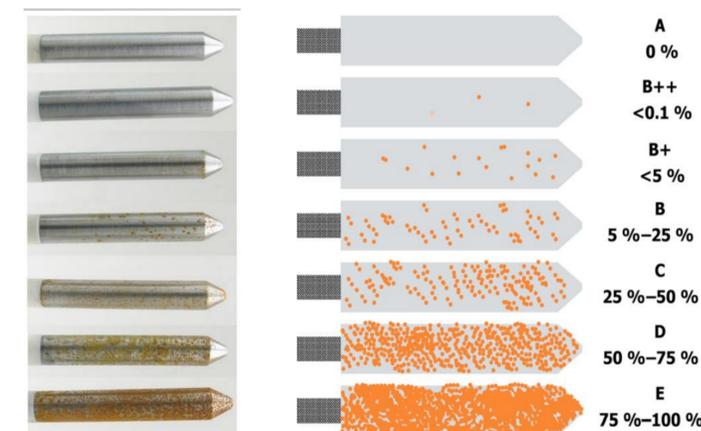
Testing Rod

Testing Jar



Data Analysis

The test rod after performing AICT shown on the left can be compared with the standard test rod result shown on the right to obtain the corresponding degree of corrosion. This result is accurate and consistent.



Conclusion

The K30269 instrument shows highly accurate and consistent results. This user-friendly and intuitive instrument features customizable settings such as bath temperature, stirring speed, and testing time which can all be adjusted on a touch screen display. These features contribute to the low cost and reduced time in performing AICT.