Oxidation Stability by ASTM D2274

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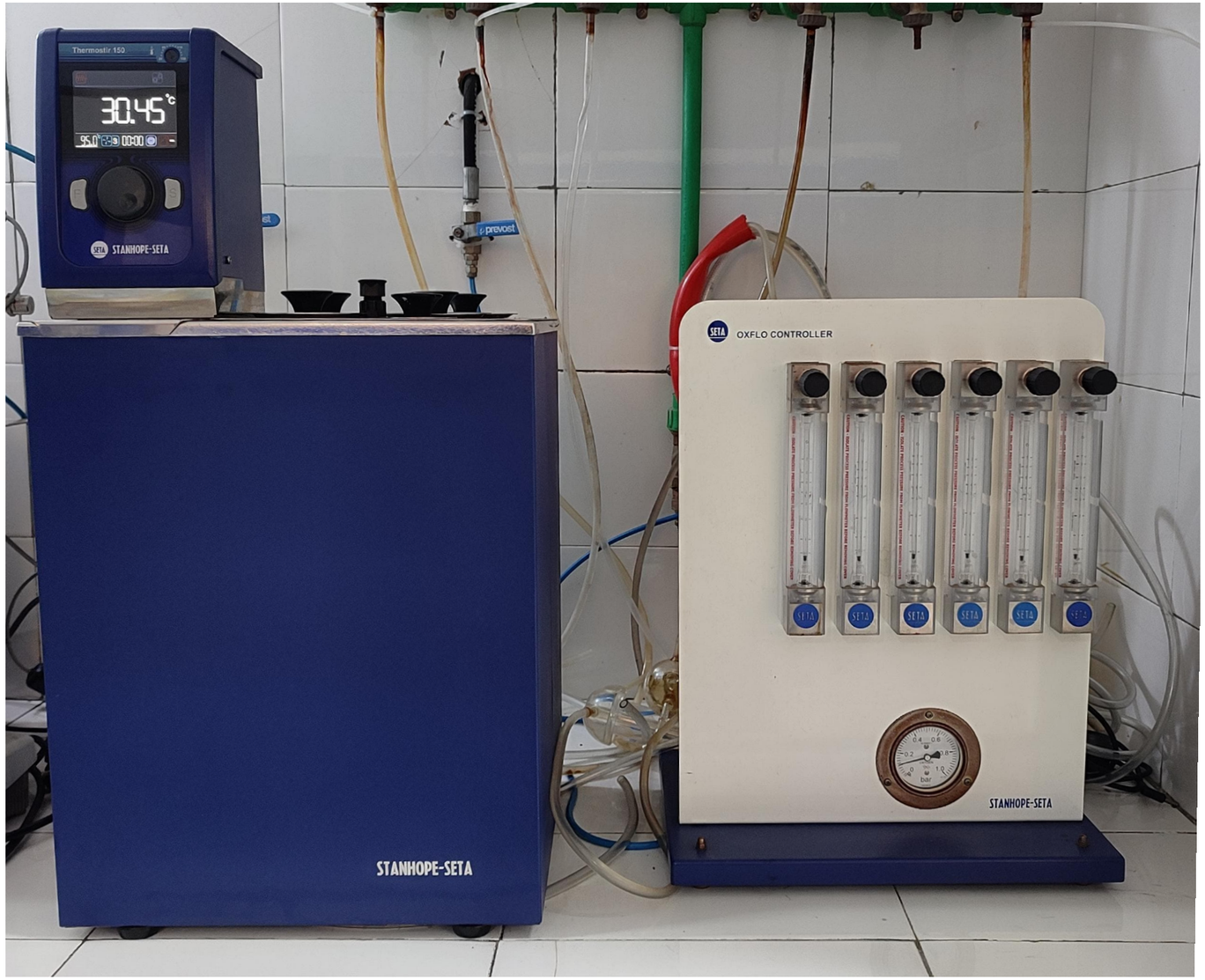
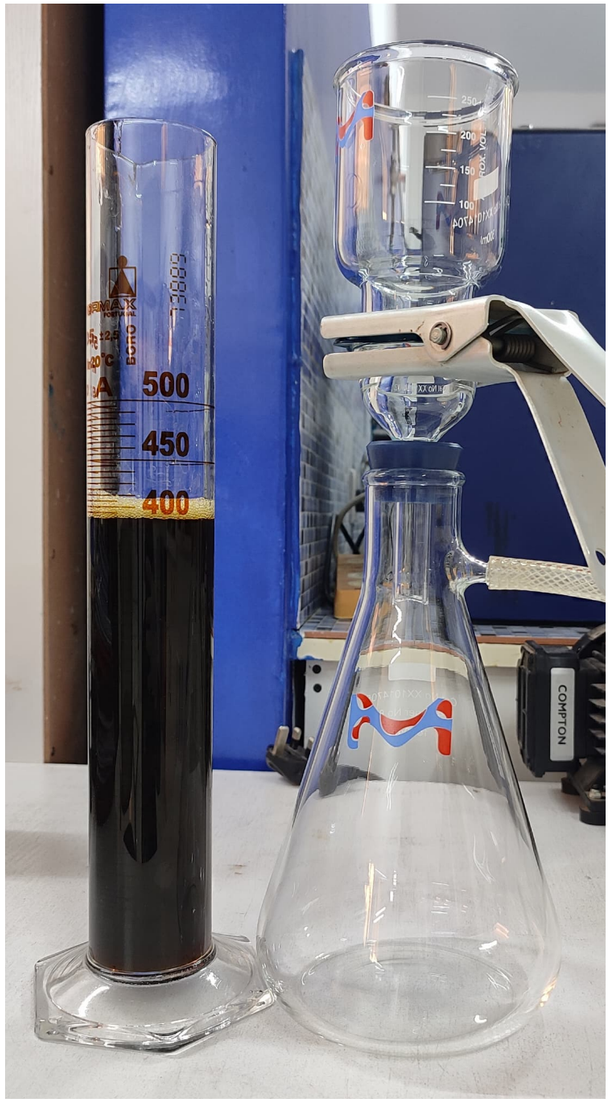
This test method measures the inherent stability of middle distillate petroleum fuels under specified oxidising conditions at 95 °C.



Why Do We Test Oxidation Stability

Bulk fuels that are stored for extended periods of time can suffer from a number of degradation issues, such as oxidisation, which can result in fuel instability and the formation of residues and gums which can cause problems with engines and fuel systems.

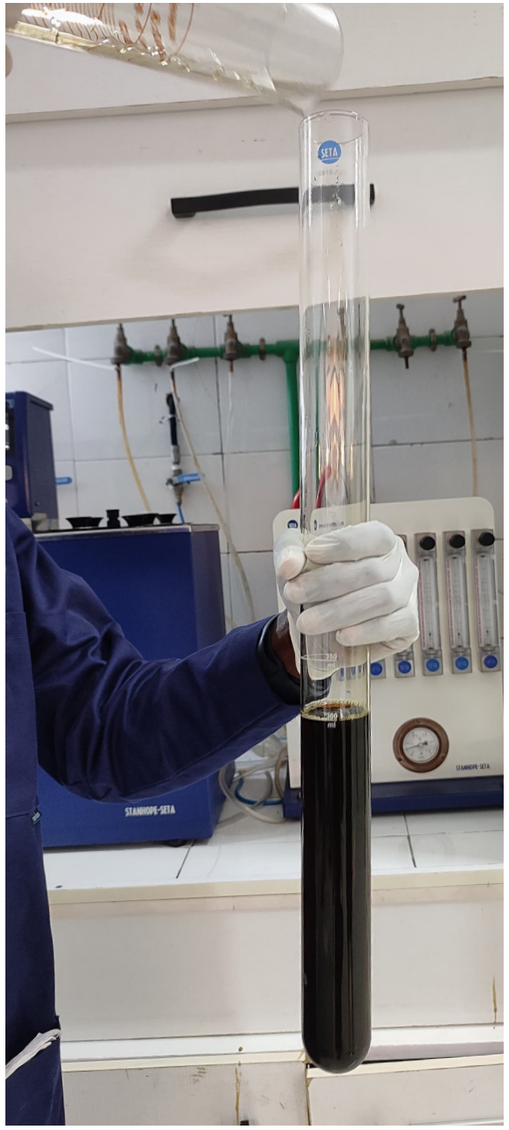
This test method provides a basis for the estimation of the oxidation stability of middle distillate fuels, however it may not provide a prediction of the quantity of insolubles that will form in field storage over any given period of time. This is because the various types of fuel oil storage are subject
to changing conditions which are too variable for this test method to predict accurately.



How Does It Work

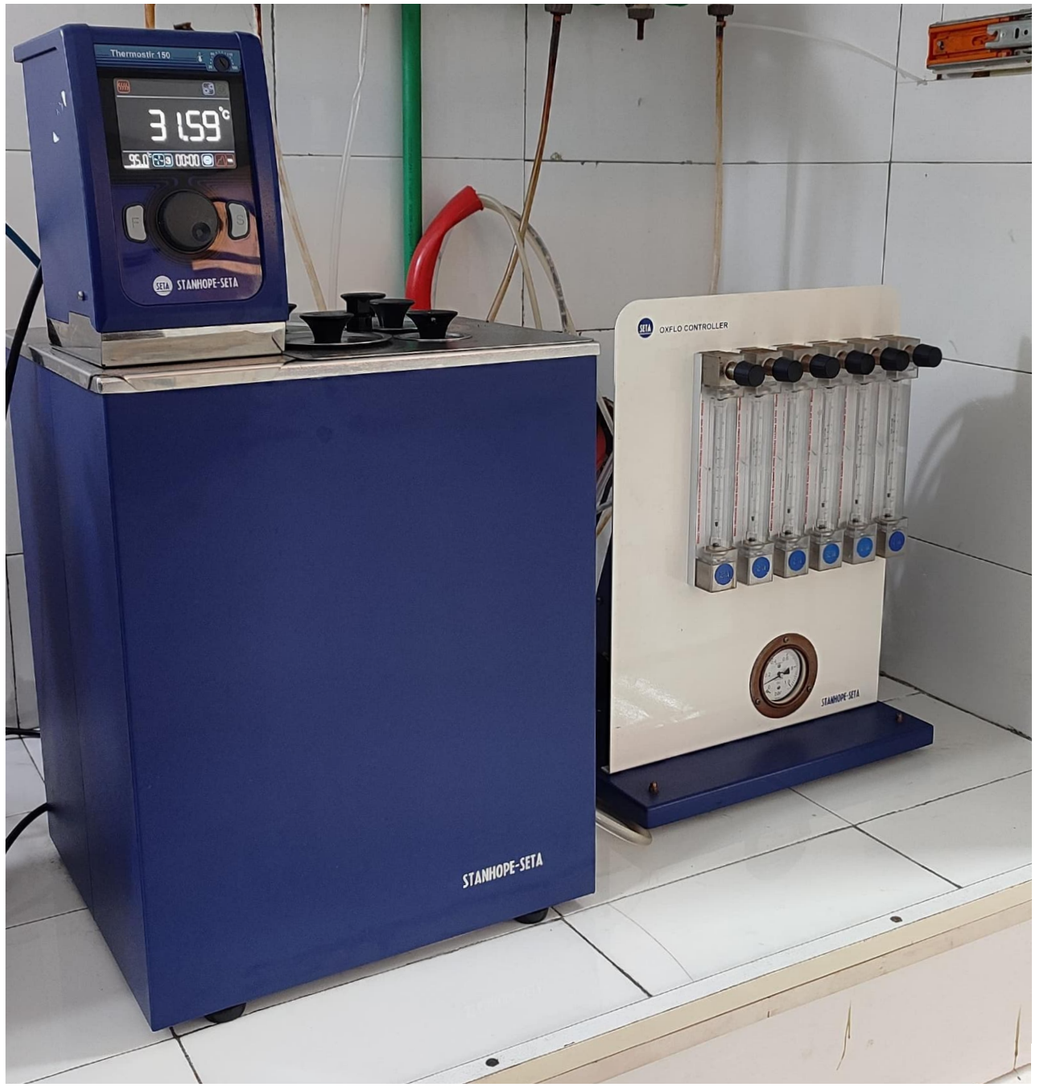
A 350 mL volume of filtered middle distillate fuel is aged at 95 °C for 16 hours, while oxygen is bubbled through the sample at a rate of 3 L/h.

After the sample has been aged, it is cooled to approximately room temperature before filtering the sample to obtain the filterable insolubles quantity. The adherent insolubles are then removed from the oxidation cell and the associated glassware with trisolvent. The trisolvent is subsequently evaporated to obtain the quantity of adherent insolubles. The sum of the filterable and adherent insoluble is reported as total insoluble and expressed in milligrams per 100 mL.

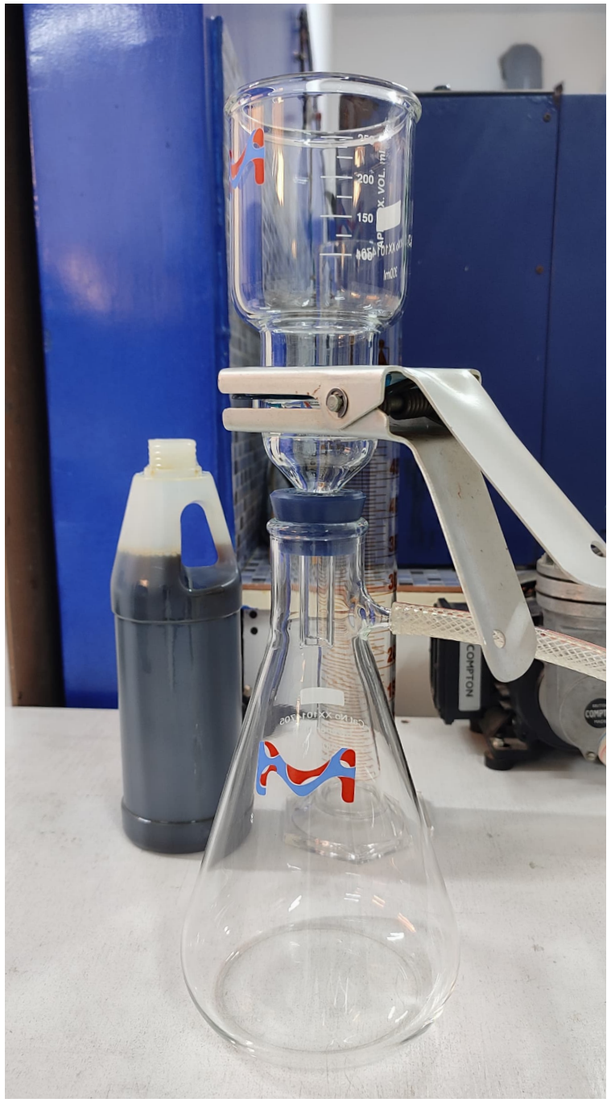


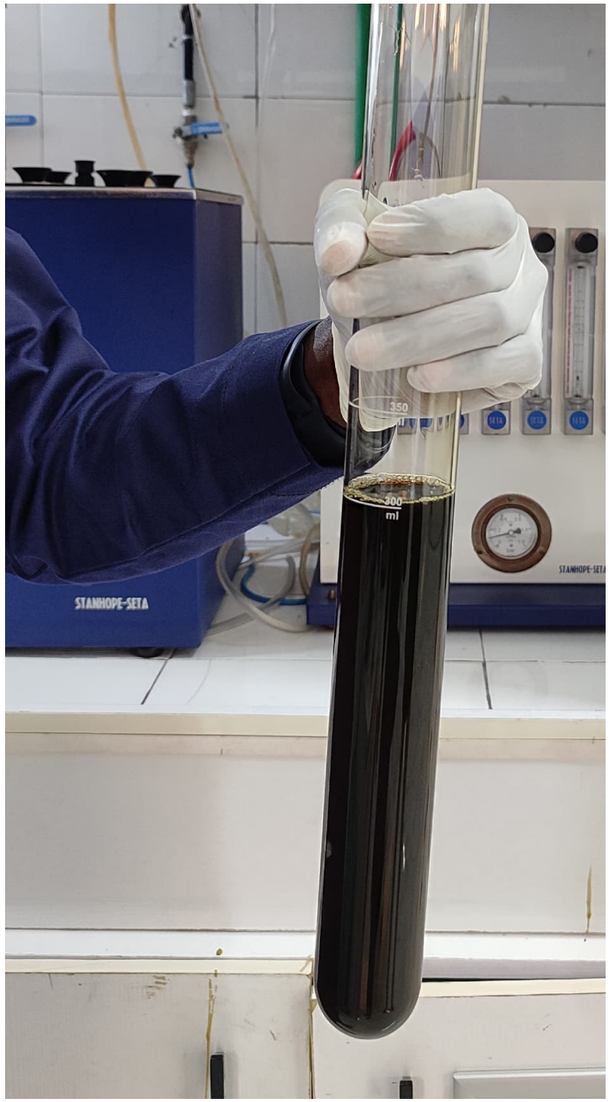
Potential Issues and Solutions:

The amount of residue to be measured in this test method is so small, it’s close to the resolution limits of analytical balances. Consequently, it is only possible to discriminate very good and relatively good fuels from very bad fuels. A more precise differentiation is not possible. Making these test methods even less reliable is the fact that the correlation of the tests with actual storage stability is still unknown.



Of additional concern is that stability may also depend upon field conditions and fuel composition. The combination of limited analytical resolution and a lack of correlation to storage stability has resulted in a lack of confidence in the methods' results; combining Oxidation stability results with analysis of other key factors is recommended and the interpretation of such results require technical knowledge and experience to correlate with some confidence.





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