

Determination of Cloud And Pour Point of Various Petroleum Products

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Abstract:- This Paper Presents To Know About The Cloud And Pour Point Using ASTM (American Standard Test Method). The Study Was Conducted In The LIET (Lords Institute Of Engineering And Technology) Campus (17.341698, 78.368758) Using Seta Cloud And Pour Point Bath We Study Cloud And Pour Point Of Normal Paraffine, Diesel, Stanadyne And Their Mix.

Keywords:- Cold Bath, Stanadyne, Digital Thermometer, Insulating Gaskets

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I. INTRODUCTION

The Cloud And Pour Point Are The Type Of Stage At Which Liquid Come Up To A Change In Their Liquid State When They Are Kept Under A Cold Bath. Here, The Cloud Point Is The Temperature At Which A Liquid Begins To Have Form The Separation Of Wax On Cooling The Particular Liquid, Whereas Pour Point Is The Temperature At Which The Liquid Becomes Semi Solid And Loses Its Flow Properties. Cloud And Pour Point Are Related To Low Temperature Characteristics Of Fuel And Tells The Behavior Of Fuel At Low Temperature. Haziness May Be Due To The Separation Of Waxes, Viscosity At Low Temperature. Due To Separation Of Waxes, Viscosity Of Fuel Oil Increases And Its Fluidity Decreases. To Presence Of Solidified Waxes Thickness The Oil And Clogs Fuels Filters And Injectors In Engine. So The Presence Of These Solid Waxes Affects The Performance Of Engines. Usually The Difference Between Cloud And Pour Points Is 4°F To 6°F. The Pour Point Tells The Temperature Below Which Oil Cannot Be Used As Lubricant. Cloud Point Indicates The Tendency Of Oil To Plug Filters Or Small Orifices At Cold Operating Temperature. So, Cloud And Pour Point Also Tells Us The Suitability Of Lubricating Oils In Cold Condition. This Point Has To Be Predetermined Before They Are Being Supplied To The Market, Hence The Necessary Changes For The Liquid Could Be Made And Perfect Result Will Be Achieved Up. The Product Test Is Being Test By Taking Out And Holding A Small Amount Of Solution And Keeping Them Under A Cold Bath Until The Solution Happen To Reach The Required Stage.

II. EQUIPMENTS USED

1. Seta Cloud And Pour Point Bath

- The Seta Cloud And Pour Point Bath Is Used To Give The Required Cold Bath To Liquid To Take Them To The Required Stage.
- It Utilizes The Current And With The Help Of Conditioners And Couples Present In Them They Cool The Fluids Up.
- They Hold Four Test Positions.
- They Have The Ability To Supply The Temperature Range From 9°C To -69°C.
- The Equipment Identifies The Minimum Safe Operating Temperature.
- The Bath Accommodates Four Jackets And Steel Cover And A Drain Tap.



Seta Cloud And Pour Point Bath

2. Digital Thermometer

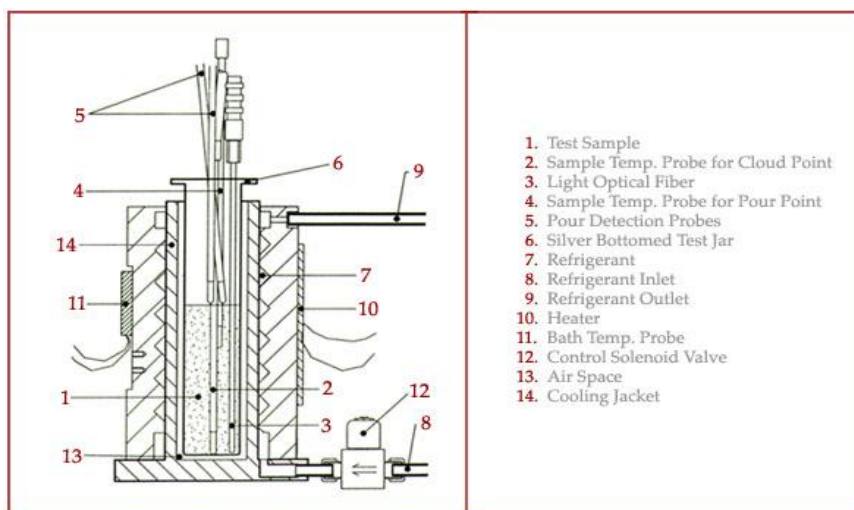
- Since The Reading Of Temperature Is Seen To Be In The Lowest Stage The Normal Thermometer Won't Be Able To Help Us In Getting The Correct Data Hence We Prefer To Use Digital Thermometer To Compare The Meter Reading On Equipment By Removing The Test Jar Out.



Digital Thermometer

III. PROCEDURE

- The Oil Is Being Kept To A Test At Temperature Of At Least 25°C About Approximate Point.
- Then Moisture That Is Present Is Being Removed By Filtration Through Any Lint Less Filter Paper Until The Oil Was Perfectly Cleared.
- Then The Oil Is Being Poured Into The Test Jar Until The Level Marked.
- Adjust The Position Of Cork Carrying The Test Thermometer Bulb At The Bottom Of The Jar
- The Ring Gasket Is Being Place In Such A Way That It Is One Inch Away From The Bottom.
- The Disk Gasket And The Inside Gasket Should Be Clear And Dry
- Then The Test Jar Is Being Placed In The Jacket And The Temperature Is Being Maintained.
- After Every 2°C Fall In Temperature The Test Jar Is Taken Out Of The Jacket And The Cloud Is Being Checked, Without Disturbing The Solution.
- The Checking Shouldn't Take, Not More Than 3 Seconds.
- The Process Is Being Further Continued Until The Solution Reaches A Stage Such That The Solution Loses The Ability To Flow, Which Is Said To Be Its Pour Stage.
- The Procedure Is Being Repeated Three Times And The Values Are Tabulated And Compared Then The Average Is Being Noted Down.



1. Test Sample
2. Sample Temp. Probe for Cloud Point
3. Light Optical Fiber
4. Sample Temp. Probe for Pour Point
5. Pour Detection Probes
6. Silver Bottomed Test Jar
7. Refrigerant
8. Refrigerant Inlet
9. Refrigerant Outlet
10. Heater
11. Bath Temp. Probe
12. Control Solenoid Valve
13. Air Space
14. Cooling Jacket

IV. TABLES

Table 1

Sl.No	FUEL	Quantity (MI)	Temperature °C	
			Cloud	Pour
1	Kerosene	40	-21.9	-25.8
2	Diesel	40	-9.3	-11.4
3	Stanadyne	40	-33.3	-36.3
4	Diesel+Kerosene	40+40	-25.3	-29.5
5	Diesel+Stanadyne	40+20	-37.7	-40.9

Table 2

Sl.No	FUEL	Quantity (MI)	TEMPERATURE °C	
			CLOUD	POUR
1	KEROSENE	40	-21.3	-25.2
2	DIESEL	40	-9	-11.3
3	STANADYNE	40	-33.5	-37.1
4	DIESEL+KEROSENE	40+40	-25.1	-29.2
5	DIESEL+STANADYNE	40+20	-37.2	-41.2

Table 3

Sl.No	FUEL	Quantity (MI)	TEMPERATURE °C	
			CLOUD	POUR
1	Kerosene	40	-21.1	-25.1
2	Diesel	40	-9	-11.4
3	Stanadyne	40	-33.4	-36.7
4	Diesel+Kerosene	40+40	-25.5	29.2
5	Diesel+Stanadyne	40+20	-37.2	-40.9

V. RESULT

According To My Experiment Stanadyne Was The Best Additive To The Diesel When Compared With Kerosene. Since Its Average Cloud Formation When Mixed Diesel Was At -37.3°C While Kerosene Was At -25.3°C.

VI. CONCLUSION

My Hypothesis Was To Prove Stanadyne Was The Best Diesel Fuel Additives With Lowest Cloud And Pour Point. My Results Do Support My Hypothesis.

The Test I Did Went On Very Smoothly Only Place Where I Struggled Was In Finding The Best Equipment To Perform The Experiment, Since A Very Low Rate Of Temperature Has To Be Supplied For The

Mix. The Test Further Went On Ahead To Come To Conclusion That Stanadyne Was The Better Fuel Additive Than The Kerosene, In Winter Season To Keep The Diesel Fuel Away From Wax Formation. The Wax Formation Would Lead To Further Damage And Nonfunctioning Of An Engine. The Stanadyne With Its Special Properties And Oils Present In Them Help Diesel To Stay Away From Wax Formation And More Over Helps The Engine To Run Much Smoothly And Too With Low Smoke Formation While The Kerosene Give Heavy Engine Crack Sounds And Also Produces A Lot Of Smoke. This Was Observed When The Mixes Where Poured Into A Diesel Tank Of A Car And Driven.

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