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Quality Control Assurance by Shield Lubricants

At Shield Lubricants we can assure the customers about quality of lubricant through base oil we use, additives we use and quality control tests we use to measure the final product quality. We are providing a brief information below about quality control system of Shield lubricants.

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The Document contains Information as under

Colours used in Titles and Subtitles:

Level 1 :

Level 2 :

Level 3 :

Detailed Presentation

1.1. BASE OIL:

We purchase Base oil from Renowned companies e.g. HPCL and importers.

Reference websites :

HPCL : www.Hindustanpetroleum.com

1.2. ADDITIVES:

Presently we purchase additives from Lubrizol, Afton and Indian Additives. We always procure these additives form Industry leading additive suppliers.

Reference websites :

Indian Additives : https://www.oronite.com/contact/asia.asp

LUBRIZOL : www.Lubrizol.com

Afton : http://www.aftonchemical.com/Pages/Home.aspx

1.3. PACKAGING:

Packaging is sourced from very big companies from where top leaders of lubricant industry are procuring there products.

2. WHAT IS THE QUALITY CONTROL PROCESS ?

2.1. QUALITY CONTROL :

This is the very important part of this model. The quality control is divided in two parts one is the **Physical & chemical parameters** and other is the **actual performance of the product**.

2.1.1. PHYSICAL & CHEMICAL PARAMETERS are those parameters which are tested in the lab. Every lubricant is manufactured with API, SAE and other world standard parameters and typical results which come from the blending of right quality and quantity of base oil and additives only.

The formulation of lubricants is devised in consultation with the specialized consultants on the basis of requirement of OEM's, API, SAE and other world standards.

If the blending is not done with the right quality and quantity, the typical values of the product will not match with the standard results. Hence if the typical values do not match the standard than the lubricants will not give actual performance what it should give.

So it is very much necessary to ensure the blending of base oil and additives with the right quality and quantity. In the end we can say that if the Physical

parameters are matched with the standard than it will give 100% performance in the market.

2.1.2. ACTUAL PERFORMANCE OF THE PRODUCT :

The actual performance of the product depends upon the equipment in which product is used, the person who did the service of the equipment, the person who is using the equipment , the environment in which the equipment is used.

In this model company can give you the test report from the plant with every batch. If any channel partner wants to check the quality from outsourced standardized labs like Intertek, Tide Water Oil Co. Ltd., etc. that can also be possible but the cost will be borne by the customer. There might be a 10 % tolerance of typical results as per the different lab. If the difference is more than that then shield will not deliver the product. If at any chance the product is delivered in the market with any deviation more than 10 % than we will take the stock back and also reimburse all the expenses of transportation which is born by customer. The material can be taken back from Customer end within a pre defined period only reason of the samples are kept for limited period.

3. ASSURANCE OF QUALITY BY SHIELD LUBRICANTS :

Shield Lubricants shall provide the tests reports containing the physical and chemical properties.

If Shield Lubricants mentions in its test Report that this oil is API CF4 and it is got tested by customer from predefined labs through mutually agreement of Shield Lubricants and customer and if the oil is not found as per the CF4 tests given by API then the cost of test reports shall be paid by Shield Lubricants and sealed materials shall be taken back by company .

Many times there are PSYCHOLOGICAL CONSUMER COMPLAINTS which means that oil meets the tests standards but as per market there is complaints in oil . The

reasons of complaint can be of many kinds e.g. end consumer is not convinced about brand of oil for many reasons etc . You will agree that company can validate the quality as per standard tests .

There are under mentioned processes of product Quality testing based on Indian & international standard.

4. PROCESSES OF QUALITY CONTROL

4.1. STANDARD QUALITY TESTS :

The quality tests can tell us that products meets the Bureau of Indian Standards i.e. IS Standards.

BIS : All the Public sector organisations e.g. Defence of India , Railways, Coal mines, etc purchases approximately 100 Crores to 300 Crores Lubricants Per year by using the Quality Testing methods of BIS for Base oil ,Additives and Finished Products .

e.g. Few of the IS Standards used by the Railways are attached in the sheet.

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Research Designs and Standards Organisation
मानक नगर, लखनऊ - 226 011
Manak Nagar, Lucknow - 226 011

अअमासं RDSO
रेल अग्रदूत Transforming Railways
www.rdso.indianrailways.gov.in

Sub Item Name	Specification No.
Antiwear Hydraulic Oil Extra Heavy Duty	IS:11656-1986/ Reaffirmed- 2002 (With Aniline Point 90°C, min. for all grades in place of seal compatibility test and NAS Value below 8), Gr.VG-32, VG-68
Gear Lubricant	IS: 8406-93/Reaffirmed-2006, (EP Type with Demulsibility & 4 ball test and min. pass load of 12th stage in FZG Niemann Test), Gr. VG-68, VG-220
Gear Lubricant, Multipurpose (Extreme Pressure Gear oil)	IS:1118-92/Reaffirmed-2006, (API-GL4 with 4-ball rig test only), Grades SAE-90, SAE-140
Internal Combustion Engine Crankcase Oils	IS:13656-2002 Type EPL-2 (API-SF) Automotive Petrol Engines, Gr.20W/40
Internal Combustion Engine Crankcase Oils	IS: 13656-2002 Type EDL-2 (API-CD, with Mak T-7 Test) Diesel Engines, Gr.SAE-40
Internal Combustion Engine Crankcase Oils for Diesel Engines of Rajdhani/Shatabdi Power Cars- PL No.80.01.0246	IS:13656-2002.Type EDL-3
Machine Tool Way Oil	RDSO Specification No.M&C/Lub/102 /2001Reaffirmed 2013, Gr. VG –32, VG –68, VG –220
Oil – Spindle	IS :493 – 1981/Reaffirmed 2004 (Part-II), GR. VG-10
Oil Hydraulic	IS:10522-83/Reaffirmed- 2004,(Antiwear) with Aniline point 90ºC,Min. in place of seal compatibility test and min. pass load of 9th stage in FZG Niemann Test), Gr. VG-32, VG-46, VG-68, VG-150
Oil Machinery/General Purpose Machinery Oil	IS:493-81/Reaffirmed-2004 (Part I) (With Rust Preventive characteristics test, as per IS:1448-P-96, Method A), Gr. VG-32, VG-46, VG-68, VG-100, VG-150, VG-220, VG-320
Oil Refrigeration Machinery	IS: 4578-1997/Reaffirmed 2004, Grade VG-68
Oil, Cutting (Neat)	IS:3065-1985/Reaffirmed-2002, Type-2, Gr.III
Oil, Cutting Soluble	IS:1115-1986/Reaffirmed-2002, with Bactericide Test

Sub Item Name	Specification No.
Oil, Cylinder, Pure Mineral	IS:1589-94/Reaffirmed-2006, Gr.VG-680 Type – I
Pneumatic Tool Oils	RDSO Specification No. M&C/Lub/101/2001 Reaffirmed 2013, Gr. VG-100, VG-220
Quenching Oil A. Mineral Type Grade: Medium with GM Magnetic Quenchometer Value of 28 Secs. Max., B. Compound Type with GM Magnetic Quenchometer Value of 25 seconds Max, C. Additive Type with G.M. Magnetic Quenchometer Value of 21 seconds max.	IS: 2664-1980/Reaffirmed 2004 for Quenching Operation of Metals
Turbine Oil	IS: 1012-2002/Reaffirmed 2005 with a min. value of 400 minutes in Rotating Bomb Oxidation Test to ASTM D2272, Gr. VG-32, VG-46, Non-ISO-VG (Non ISO VG Viscosity of this grade is 76 CST ± 10% at 400 C. All other properties shall be as per VG-68 grade.)

4.2. CHECKING BY TEST REPORTS THAT THE ADDITIVES ARE SUPPLIED BY THE PRE DEFINED LEADING MANUFACTURERS OF INDIA

As per this method we can assume that if the Additives are supplied by leading manufacturers e.g. Lubrizol , others then it can be said that quality is appropriate.

And if the formulation says that additive is to be added as 10% , is 10 Percent additive is added or lesser additive is added in manufacturing finished product.

Test of Additives to check this is supplied by which vendor and how much quantity is added in the finished product is done by FTIR analysis test :

This test shows that all the additives like detergents, anti foam agents, dispersants, anti wear additives are used in how much percentage in the finished product. E.g. Lubrizol says in its product data sheet that after adding anti wear additive in the base oil the product will show anti wear additive as 1200 Particles in per million so we can see from the under mentioned FTIR analysis report are they showing that much or not. If these are showing then it means the additive is of Lubrizol. Reason is if we use the additive from any

other company it may say that in CF4 grade the anti wear composition will be 1250 PPM so in that case it will be additive of that company.

4.3. TYPES OF LUBRICANTS TESTING METHODS

There are 3 kinds of tests broadly defined, these are

4.3.1. **PHYSICAL AND CHEMICAL PROPERTIES TESTS:** These are done in laboratory. The cost varies for normal tests approx. Rs 500-1000/Property of the oil .

4.3.2. **BENCH TESTS :** These are done in laboratory. The cost varies for normal tests approx. Rs 20000-50000/Bench test .

4.3.3. **ACTUAL FIELD TRIAL TESTS :** These are done by actual running vehicle in the field . These are costlier tests and done by very few organisations.

5. LUBRICANT STANDARDS ORGANISATION (AMERICAN PETROLEUM INSTITUTE (API))

The American Petroleum Institute (API) is the leading international trade association that represents all aspects of oil and natural gas industry. From the largest major oil company to the smallest of independents, come from all segments of the industry. They are producers, refiners, suppliers, pipeline operators and marine transporters, as well as service and supply companies that support all segments of the industry.

AMERICAN PETROLEUM INSTITUTE (API) doing no. of test before giving any specification. In these tests they follow American Society for Testing and Materials (ASTM) and other organizations. Based on their research they provide the tests which proves that the lubricant if of this specification . e.g. we have mentioned below API CF4 specification tests given by API . If these tests are done it will prove that the oil is of API CF4 specification.

5.1. TESTS AS PER API ARE MENTIONED BELOW :

Test	Application	Parameter	Test limit
Seq VIII ASTM D6709	Bearing wear	Bearing weight loss, mg, max	33
T-6	Ring and liner wear	Merit rating, min	90
Or			
T-9 ASTM D6483	Ring and liner wear	Top piston ring weight loss, average, mg, max	150
		Liner wear, µm, max	40
Or			

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Seq VIII ASTM D6709	Bearing wear	Bearing weight loss, mg, max	33
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Or			
T-9 ASTM D6483	Ring and liner wear	Top piston ring weight loss, average, mg, max	150
		Liner wear, µm, max	40
Or			
T-10 ASTM D6987	Ring and liner wear	Top ring weight loss, mg, max	180
		Liner wear, µm, max	47
T-8A ASTM D5967	Soot related viscosity increase	Average rate of kin viscosity increase from 100 to 150 h, mm^2/s at 100°C/h, max	0.2
Or			
T-7	Soot related viscosity increase	Average rate of kin viscosity increase during last 50 h, mm^2/s at 100°C/h, max	0.04
CBT ASTM D5968	Bearing corrosion	Copper, mg/kg increase, max	20
		Lead, mg/kg increase, max	60
		Tin, mg/kg increase, max	Report
		Copper strip rating, max	3
			Two-test limit 1K

1K ASTM D6750	Aluminum piston deposits	Weighted demerits, max	332
		Top groove fill, %, max	24
		Top land heavy carbon, %, max	4
		Average oil consumption, g/MJ, (0-252 h) max	0.139
		Final oil consumption, g/MJ, (228-252 h), max	0.075
		Piston, ring, and liner scuffing	None
		Piston ring stick	None

There is a List of Laboratories from where you can get the testing done e.g. Intratek Mumbai , Shriram Delhi , IOCL Faridabad. You can do the contact with them or we can also coordinate the same on paid basis.