

Equivalent Standard Test Methods for Lubricating Oils

	ASTM	CEN	DIN	FTMS	IP	IS	ISO	NF	Others
Acidity Inorganic					182	IS:1448,P:2			
Acid Value/ Neutralization Number	D974		5155 8part1	5105	139				
Acidity Total, Potentiometric				5106	177	1448, P:1	DIS : 6619		
Air Release Value	D3427		51831		313	1448,P:102		T 60149	
Aniline Point	D611	P:EN56	51787	3601	2	1448, P:3	2977	M 07021	
Ash Content	D482		EN7	5421	4	1448, P:4	6245		
Ash Sulphated	D874		51575	5422	163	1448, P:4	3987	T-60143	
Barium by Emission					187	1448, P:103			
Base No Total	D2896				276	1448, P:86	3771		
Boiling Range of Organic Liquids	D1088								
Borderline Pumping Temperature	D3829								
Bromine Number (Color Indication Method)					129	1448, P:43			
Calcium in Lube oils					111				
Calcium by Emission					187	1448, P:103			
Carbon Residue									
Conradson	D189		51551	5001	13	1448, P:122	6615		
Ramsbottom	D524				14	1448, P:8	4262	T-60117	
Channel Point				5002					
Cast Iron Corrosion Test					125	1115			
Chlorine (Bomb Method)	D808		51577	5651					
Clay Gel Analysis	D2007		51384					NFT60-155	
Cloud Point	D2500	prEN6	51597		219	1448, P:10	3015	T-60105	
Cold Cranking Simulator Viscosity	D2602		51377		350	1448, P:108		SAE J300	
Colour ASTM	D1500		51578	102	196	1448, P : 12	2049		
Demulsibility	D2711								
Dielectric Strength					295			BS148, APP C	
Distillatio, ASTM	D 86		51751	1001	123	1448, P:18	3405		
Elastomer Compatibility Test	D3604								
Evaporation Loss	D972	U11	51581				DIS : 3987		
Falex Film Strength	D2670								
Fire Point	D92		51376	1103	36	1448,P:69	2592		
Flash Point (COC)	D92	U10	51376	1103	36	P:69	2592	T-60118	
Flash Point (PNCC)	D 93		51758	1102	34				
FZG Gear Rating			51354		334				
Frothing Test for Soluble Oils					312	1115		APP. A	

	ASTM	CEN	DIN	FTMS	IP	IS	ISO	NF	Others
Interfacial Tension	D 971						6295		
Hexane Insolubles	D 893			3121					
HTHS Viscosity	D4624 D4683								
Hydrolytic Stability	D2619								
ISO Viscosity Classification	D 2422								
Melting Point (Cooling Curve Method)	D 87			1402	55		3841		
Nitrogen Content	D3228								
Oxidation Characteristics of									
Extreme Pressure Lube Oils	D2893		51586						
Oxidation Characteristics of									
Inhibited Steam Turbine Oils	D943		51587			1448,P:106			
Oxidation Stability of									
Steam Turbine Oils by rotating Bomb	D2272				229				
Oxidation Stability of									
Mineral Turbine Oils Use-Assessment					328				
Oxidation Test for Lubricating Oils			51352 Pt 1		48	1448,P:65			
Particulate Count - Automatic					327				
Particulate Count - Microscopic	F312				275				
Pentane Insoluble	D 893			3121					
PH Value	D 664		51369	5106	177	1448,P:1			
Phosphorous	D4047				149	1448,P:54			
Precipitation Number	D91		51586	3101					
Pour Point	D97		51597	201	15	1448,P:10	3016		
Quenching Time by Magnetic Quencherometer	D 3520								
Refractive Index	D1747 D1218		51423 Part 2						
Rust and Corrosion Test									
(Humidity Cabinet Test)	D 1748		51359	5310	366				
Ring Analysis (Ca-Cp-Cn)	D3238								
Rust Test	D665		51585	4011	135	1448,P:96	DIS:7120		
Saponification Number	D94	DP6219	51559,PartH	5401	75	1448,P:55	3734	T60112	
Sediments By Centrifuge	D1796		51793	3000	75	1448,P:41	3734		
Specific Gravity	D 1298		51757		160	1448, P:16	3675	T 60101	
Sediments By Extraction	D473		51789	3002	53	P : 30	3735		
Stable Pour Point						496			APP
Steam Emulsion number			51589		19	1448,P:95			
Surface Tension	D971						6295		
Sulphu by bomb	D129	EN41				1448,P:33		T-60142	

	ASTM	CEN	DIN	FIMS	IP	IS	ISO	NF	Others
by XRF	D2622		51400 Part B			1154			
Stability Test for Rust Preventives									
Sulphur in Cutting Oils			51366	155					
Viscosity Gravity Constant	D2501								
Timken OK Load	D2782			240					
Unsulphonated Residue	D483		51362	5441					
UV Absorption Test	D2008								
Viscosity Gravity Content	D2501								
Viscosity Index	D2270		51564	9111	226	1448,P:56	2909	T-60136	
Water content by Dean & Stark	D95		51582	3001	74	1448,P:40	3733	T-60113	
Water Content by Karl Fischer	D1744		51777 Part I		178		2362	DIS:6296	
Water Displacing Properties of Corrosion Preventives									
Wear Test Vickers Vane Pump	D 2882		51389	3253	281				
Weld Load Four Ball					239				
Yield Stress & App. Vle. at Low temp	D4684				117	1448,P:120			
Zinc in Lube Oils					187	1448,P:103			
Zinc by Emission									

DO YOU KNOW

CLASSIFICATION OF GREASES

- 1. On the basis of Liquid lubricants :**
 - 1.1 Conventional Greases from Mineral base oils.
 - 1.2 Synthetic Greases from Silicone oils, Esters and PAO.
 - 1.3 Biodegradable Greases from modified vegetable oils.
- 2. On the basis of thickeners :**
 - 2.1 Soap based greases.
 - 2.2 Non-soap based greases.
- 3. On the basis of Soap used :**
 - 3.1 Single soap - Sodium, Calcium, Lithium, Aluminium.
 - 3.2 Mixed soap – Sodium calcium, Sodium lithium, Calcium lithium.
 - 3.3 Complex soap – Sodium complex, Lithium complex, Calcium complex, Sulfonate complex, Aluminium complex.
- 4. Non soap based greases**
 - 4.1 Clay based.
 - 4.2 Silica.
 - 4.3 Carbon black.
 - 4.4 Polyurea.
 - 4.5 PTFE.
- 5. On the basis of Additives:**
 - 5.1 Functional additives like Graphite greases, Moly greases.
 - 5.2 Performance enhancing additives like EP greases, High water resistance greases.
- 6. On the basis of User segment:**
 - 6.1 Automotive greases.
 - 6.2 Industrial greases.
 - i. Steel plant application greases.
 - ii. Cement plant application greases
 - iii. Power plant application greases.
 - iv. Textile application greases.
 - v. Defense application greases.
 - vi. Railway locomotive / axle bearing greases
- 7. On the basis of end application :**
 - 7.1 Wheel Bearing greases.
 - 7.2 Chassis greases.
 - 7.3 Cup greases.
 - 7.4 All purpose greases.
 - 7.5 High/ Low temperature greases.
 - 7.6 Water resistance greases.

(Source: Mr. P. M. Ozarkar, OM Consultant)

Equivalent Standard Test Methods for Greases

	ASTM	CEN	DIN	FTMS	IP	IS	ISO	NF	Others
Acidity, Total Acid No. Potentiometric	D664			5106	177	1448,P:1	DIS :6619	T-60133	
Ash Content		D128		51803		1448,P:4,Method B		T-60144	
Base Number Total	D2896				276	1448,P:86	3771		
Chlorine Content in New & old Greases	D808		51577	5651					
Churning Test of Rolling Bearing Test					266				
Colour ASTM	D1500		51578	102	196	1448,P: 12	2049		
Corrosion Protection (EMCOR)	D 3294		51802		220			T-60135	
Copper Corrosion	D 1261 & D 4048			51811	5314	154		Mo7115	
Deleterious Particles	D1404					1448,P:125			
Density & Relative Density	D1298		51757		160	1448,P:16	3675		
Drop Point	D566		51801 Part1		1421	132	1448,P: 52	2176	T-60102
Drop Point (Wide Temperature Range)	D2265								
Effect of Copper on Oxidation									
Stability of Greases	D1402								
Evaporation Loss 2 hours Drying							1448,P:61		
Evaporation Loss	D972			351	183	1448,P:68			
Evaporation Loss Wide Temperature Range	D2595								
Extreme Pressure Properties	D2596		51350 Part1					239	
Filters Content	D 128		51831						
Fire point	D92		51376	1103	36	1448,P:69	2592		
Flash Point (COC)	D92		51376	1103	36	1448,P:69	2592		
Foreign Particles						134			
FZG test				51354					
Heat Stability of Calcium Base Greases					180	1448,P: 62			
High temperature Performance	D3336							DEF2000	Method No.27
Lead Content in new & used greases	D1262								
Leakage Tendency of									
Wheel bearing Greases	D1263			3454					
Low Temperature Torque	D1478			334	186				
Mean Hertz Load	D2783				239				
Mineral Oil Content	D128		51814			1448,P:59			
MoS2 Content	D128		51831	3722		1448,P:58			
Nitrogen Content	D3228								
Oil Separation during Storage (Static)	D1742		51817	322	121	1448,P:85			
Oxidation Stability	D942	2137	51808	3453	142	1448,P:94			

	ASTM	CEN	DIN	FTMS	IP	IS	ISO	NF	Others
Penetration	D217	DP6298	51804, Part1		311	50	1448,P:60	2137	T-60132
Penetration ½ & 1/4 Scale Cone	D1403		51804, Part2			310	1448,P:116	DIS:6298	T-60140
pH Value	D664		51369	5106	177	1448,P:1			
Pour Point	D97		51597	201	15	1448,P:10	3016		
Refractive Index	D1747		51423						
	D1218		part 2						
Roll Stability Test	D1831								
Rolling Bearing Performance Test					168				
Rust Preventive Properties	D1743		4012						
Saponification Number	D94		51559 Part1		5401	136	1448,P:55	6293	
Soap Content	D128		51814						
Soap type Lithium & Sodium	D3340		51815		199				
Specific Gravity	D 1298		51757		160	1448,P:16	3675		T-60101
SKF RZF			51806						
Sulphur by Bomb	D129			5202	61	1448,P:33			
Sulphur by XRF	D2622		51400 PartB			336			
Timken OK Load	D2509				326				
Viscosity, Apparent	D 1092			306					
Viscosity Index	D2270		51564	9111	226	1448,P: 56	2909		
Viscosity Kinematic	D 445	U3	51550	305	75	1448,P:25	3104		
Water Content	D95	3733	51582	3001	74	1448,P: 40	3733		T-60113
Water Resistance Test	D4049								
Dynamic Water Resistance	D1624		51807 Part2		3252	215	1448,P: 90		
Wear Scar Diameter	D1264		51530 Part1		6514	239			
Weld Load					239				

MAJOR REFINERY PRODUCTS

- 1. Gasoline :** The most important refinery product is motor gasoline, a blend of hydrocarbons with boiling ranges from ambient temperatures to about 200 °C.
- 2. Kerosene.:** Kerosene is a refined middle-distillate petroleum product that finds considerable use as a jet fuel and around the world in cooking and space heating.
- 3. Liquefied Petroleum Gas (LPG).:** LPG, which consists principally of propane and butane, is produced for use as fuel and is an intermediate material in the manufacture of petrochemicals.
- 4. Distillate Fuels.:** Diesel fuels and domestic heating oils have boiling ranges of about 200°-370° C.
- 5. Residual Fuels.:** Many marine vessels, power plants, commercial buildings and industrial facilities use residual fuels or combinations of residual and distillate fuels for heating and processing.
- 6. Coke and Asphalt.:** Coke is almost pure carbon with a variety of uses from electrodes to charcoal briquets. It is used for roads and roofing materials.
- 7. Solvents.:** A variety of products, whose boiling points and hydrocarbon composition are closely controlled, are produced for use as solvents. These include benzene, toluene, and xylene.
- 8. Petrochemicals.:** Many products derived from crude oil refining, such as ethylene, propylene, butylene, and isobutylene.
- 9. Lubricant Base stock .:** Special refining processes produce lubricating oil base stocks.