



# INDUSTRIAL LUBRICANTS

 **SERVO**<sup>®</sup>  
WORLD-CLASS LUBRICANTS  
100% PERFORMANCE. EVERYTIME.  
PRODUCT LINE



INDIAN OIL CORPORATION LTD., INDIANOIL BHAVAN, G9, ALI YAVAR JUNG MARG, BANDRA (E), MUMBAI - 400051

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## FOREWORD

In this era of globalization and intense competition, customer delight, core competency and cost effective solution are the watchword of any enterprise, irrespective of its business standing. In IndianOil, customer interest has always been the centre to our operations and it is this focus which has earned us the continued support and patronage of our customers. It is this zeal that has made us the biggest commercial enterprise and the leading Fortune Global 500 Company in India.

**SERVO**® enjoys the Superbrand status and it is India's No.1 Lubricant brand not only in terms of sales but also in terms of technology and range. We owe this success to our R&D Centre which is one of its kind in this part of the world. The lubricant formulation it has developed has moved from mere indigenization in 1970s to global standards now, even exceeding in terms of its customized formulations and performance standards to specific requirement of the customers and OEMs. Indian Oil has also been innovating in terms of improvements in energy, economy, environment and emission control through lubricant formulations and has set a standard for itself which has become a bench-mark in Industry.

IOC's endeavor has always been to provide the best possible guidance on lubrication to our customers for optimum utilization of resources. Towards this end, an updated version of the Product Line Booklet is presented, which provides succinct information on various Industrial Lubricating Oils and Greases marketed by IndianOil and approved by Indian and Foreign OEMs operating in the country. This booklet would serve as reference material to our customers.

However, for proper recommendation and application of these products our customers are requested to avail the services of our experienced Technical Services Engineers who are posted across the country in State Offices besides our Head Office in Mumbai.

February, 2014

Mumbai



(Makrand Nene)  
Director (Marketing)

## INTRODUCTION

This Product Line booklet on the Industrial Lubricants of **SERVO**® offers a detailed outline of the vast range of the Lubricants offered by **SERVO**® for every conceivable industrial application. Developments in Industrial Lubricants move in lockstep with the rapid pace of design and technological evolution in Industrial automation to ensure reliability and safety and enhance productivity. Backed by our formidable R&D, **SERVO**® has been coming with products and formulations to match up to the rigorous performance standards as demanded by the OEMs for industrial applications.

This product line on Industrial Lubricants provides a comprehensive yet concise compilation of the technical specifications of the range of Servo Industrial Lubricants and greases marketed by IndianOil. In addition to this, we've also presented useful content on the correct lubrication principles for the **SERVO**® customers for better resource optimization.

We are pleased to present this product line booklet on Industrial Lubricants to our esteemed customers, for whom this would serve as a useful ready reckoner.

February, 2014

Mumbai



(Debasis Sen)  
Executive Director I/C (Lubes)



**इंडियन ऑयल कॉर्पोरेशन लिमिटेड**

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**IndianOil**

विपणन प्रभाग  
Marketing Division

Ref: MSO/L/SSI-M/1-01

Date: 20.11.2013

**TO WHOMSOEVER IT MAY CONCERN**

**Sub: Authorized Servo Stockiest Industrial – M/s. Hindustan Lubes for Districts of Mumbai, Raigad & Ratnagiri**

We are pleased to inform all our esteem customers that we have Servo stockiest Industrial (SSI) M/s. Hindustan Lubes, Mumbai as authorized stockiest appointed by IOCL.

M/s. Hindustan Lubes– SSI, Mumbai will be catering the direct industrial customers in Mumbai, Raigad & Ratnagiri districts. The entire range of SERVO lubricants will be made available for our esteem customers through the above stockiest.

M/s. Hindustan Lubes is authorized to Quote & supply SERVO lubricants to esteem customers.

M/s. Hindustan Lubes, Mumbai is our sole authorized SERVO Industrial stockiest for the mentioned districts.

Contact Name & Address of SSI Mumbai –

Mr Sunil Shah

M/s. Hindustan Lubes

407, ZAFRYN Chambers,

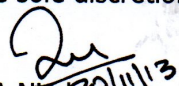
Opp Sewri Railway Station,

Sewri (E), Mumbai – 400 015

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We assure you best of the services & products at all times.

In case of any clarification you may contact the undersigned. The validity of this letter is to the sole discretion of IOCL.

  
S A Nirmal  
Mgr ILS, Mumbai







# HINDUSTAN LUBES

AUTHORISED STOCKIST : INDIAN OIL CORPORATION LIMITED



IndianOil

407, ZAFRYN CHAMBERS, OPP. SEWRI RLY. STN, SEWRI (E) MUMBAI - 400 015  
Tel: 022-2413 1828 / 2831 Fax: 022-2413 2705 E-mail: servostockist@rediffmail.com

Dear Sir / Madam,

We would like to introduce ourselves as the Only Authorized Stockist and Suppliers of Lubricants of Indian Oil Corporation Ltd for the districts of Mumbai, Raigad & Ratnagiri. We would like to share with you the latest developments made by Indian Oil Corporation Ltd relating to Sales and Customer satisfaction.

IOC as you may be aware is a largest manufactures of world-class lubricants. During the past several years of operations IOC have been selling their Industrial Lubricants through their network of various Dealers, Lube Distributors and Resellers. As a result of this IOC has never been able to know and interact with the actual users of their products to get their valued feedbacks and suggestions. This has also given the spurious suppliers a scope for selling adulterated lubricants to the industries as SERVO Products.

You will be glad to know that IOC has appointed us as SERVO Stockist –Industrial for the districts Mumbai, Raigad & Ratnagiri. We would be Sole Suppliers of Industrial Lubricants of Indian Oil Corporation Ltd and would be catering to the requirements of all existing as well as new customers of IOC in the above mentioned districts. Since we would be the sole suppliers it would kill the market of suppliers of adulterated Servo products. Also we would provide a much required link between the actual users of Servo products and IOC and keep them updated, so that customer satisfaction can be achieved.

We have been appointed by IOC as the stockist knowing our capability to provide a reliable and responsive service to their customers. We can arrange for stocks at a very short notice and offer prompt service to our customers. We also offer to our customers with the help of IOC officers Technical Assistance for using the right type of lubricants for optimum performance and trouble free operations. We also offer Free Deliveries and Excise Modvat benefits.

Kindly let us know your requirement of lubricants for us to give you the most Competitive rates

**Sole Suppliers of Industrial Lubricants of Indian Oil Corporation Ltd.**  
**Dist : Mumbai, Raigad, Ratnagiri**

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
<b>Turbine Oils</b> Servoprime 15 Servoprime 32 Servoprime 46 Servoprime 57 Servoprime 68 Servoprime 76 Servoprime 100	13 – 16 29 – 35 42 – 50 54 – 60 62 – 74 75 – 80 96 – 104	100 100 98 95 95 95 95	160 200 200 210 210 220 220	Servoprime oils are premium turbine oils formulated with superior quality hydro-treated base stocks and possess exceptional thermal and oxidation stability, excellent demulsibility, air release property and resistance to foaming. These oils meet IS:1012-2002, BS 489, L-TSA & L-TGA specifications of ISO 8068:2006(E), General Electric GEK27070, Siemens (KWU) spec. TPS 9013 04 (KWU), GEK 28143A, GEK 32568C, GEK 101941A (for Servoprime 32) & GEK 32568A for Gas Turbine (for Servoprime 32) and BHEL turbine oil requirements. Servoprime oils provide long service life and are recommended for lubrication of steam, gas and hydraulic turbines and can be used in hydraulic systems requiring long life lubricant of outstanding properties.
Servoprime 32 T Servoprime 46 T Servoprime 68 T Servoprime 76 T	29 – 35 42 – 50 62 – 74 75 – 80	100 98 95 95	200 200 210 220	Servoprime T oils are similar to Servoprime oils but in addition contain anti-wear additives. These oils have higher FZG ratings and meet the requirements of geared turbines. Servoprime T oils meet specifications of ALSTOM HTGD 90117, GEK 28143 and Siemens-TLV 901304 (KWU).
Servoprime 32 LP Servoprime 46 LP Servoprime 68 LP	29 – 35 42 – 50 62 – 74	100 98 95	200 200 210	Servoprime LP oils are low pour-point turbine oils formulated with superior quality hydro-treated base oils and have excellent oxidation stability and anti-rust and anti-foam characteristics. Recommended for low temperature applications like Rotoflow expanders and Turbo-compressors used in refrigeration applications.
Servoprime 32 LL Servoprime 46 LL Servoprime 68 LL	29 – 35 42 – 50 62 – 74	100 98 95	215 215 215	Servoprime LL oils are long life turbine oils with superior oxidation stability and improved anti-wear performance. These oils have potential for providing problem- free long life in turbines of modern power plants working under most severe operating conditions. Exceed the requirements of all National and International specifications and carries the approval of major OEMs like BHEL, Siemens etc.

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
Servoprime 32A	29 – 35	100	200	Servoprime 32A is specially designed turbine oil, with high anti-wear properties, formulated with superior quality hydro-treated base stocks. Recommended by GEC-Alstom for use in gas turbines against GEK 28143A specification.
Servoprime 32 GR	29 – 35	100	215	Servoprime GR oils are formulated with superior quality hydro-treated base oils, specially designed to satisfy the demanding requirements of modern high output gas turbines including geared units. Exceed the specification requirement of GEK 32568f of GE Turbines.
Servoprime 32 G Servoprime 46 G	29 – 35 42 – 50	100 100	210 210	Servoprime G oils are high anti-wear type turbine oil, formulated with superior quality hydro-treated base oils, specially designed to satisfy the demanding requirements of modern high output gas turbines including geared units. Exceed the specification requirement of Alstom HTGD 90117, GEK 32568F, BHEL GT10198, Siemens TLV 901304 and L-TSA, L-TGA, L-TSE, L-TGE, L-TGB, L-TGSB, L-TGF & L-TGSE specifications of ISO 8068:2006(E). The product has got approvals from BHEL, Siemens and Alstom.
Servoprime 32 XL Servoprime 46 XL	29 – 33 42 – 50	100 98	210 210	Servoprime XL oils are specially designed turbine oils meeting Mitsubishi Heavy Industries (MHI) specification MS 04-MA-CL001 (Rev. 2) & MS04-MA-CL002 (Rev. 2) for application in heavy duty single to multi-shaft steam and gas turbines with bearing ambient temperature of above 250 deg C. The oil has excellent thermal/oxidation properties with minimal sludge generation tendency.
<b>Synthetic Turbine Oil</b> Servoprime SHC 32 Servoprime SHC 46	28 – 36 40 – 52	137 145	235 235	Servoprime SHC Oils are PAO based Turbine oils specifically designed to meet severe industrial gas turbine applications. It has TOST life of more than 10,000 hrs. and meets ISO 8068:2006 (E), L-TGCH for synthetic turbine oils. It provides outstanding low temperature fluidity, excellent anti-wear performance and exceptional resistance to degradation at higher temperature.

02



## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
<b>Control Valve Hydraulic Fluid</b> Servoconval 46	42 – 50	98	215	Servoconval 46 is a premium quality hydraulic fluid recommended for use in the HP/ LP bypass system of steam turbines. Formulated with superior quality hydro-treated base stocks, it provides reliable service of control valves and is particularly helpful when fine sintered bronze filters are present in the circuit. Approved by M/s. BHEL.
Servoact AF 100	90 – 110	95	220	Servoact AF 100 is high performance actuator oil specially developed for electrohydraulic SPL actuators (Compact drives and electrohydraulic drives) in turbine governor systems. Meets BHEL TC 58063 specifications.
<b>Fire Resistant Electro Hydraulic Control Fluid</b> Servosynturbo GF 46	40 – 52	–	235	Servosynturbo GF 46 is phosphate ester based, fire resistant, turbine governor fluid designed for use in electrohydraulic governor control systems of steam turbines operating at higher steam temperature and pressure, including systems using fine tolerance Servo Valves. It is approved by BHEL against its ST 22007 standards.
<b>Circulating and Hydraulic Oils (R&amp;O Type)</b> Servocirol 32 Servocirol 46 Servocirol 68 Servocirol 100 Servocirol 150	29 – 35 42 – 50 62 – 74 90 – 110 135 - 165	95 95 95 90 90	196 200 210 210 230	Servocirol oils are premium quality R&O type hydraulic oils formulated with superior quality hydro treated base stocks Servocirol meet IS:3098-1983 (Reaffirmed 2004), DIN-51524 H and HL (except for very low pour point) and US Steel 135 requirements. Servocirol 32, 46, 68 and 150 also meet Cincinnati Machines, U.S.A. specification P-38, P-55, P-54 and P-57 respectively. Servocirol oils are recommended for hydraulic system, circulation system of industrial gearboxes, air compressors requiring turbine quality oil and for plain and anti-friction bearings of turbo feed pumps, turbo blowers, etc. These Oils can be used for lubrication of intermittently operating turbo generator sets where oil is changed after short duration.

03

## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
<b>Circulating and Hydraulic Oils (Anti-wear Type)</b> Servosystem 22 Servosystem 32 Servosystem 46 Servosystem 57 Servosystem 68 Servosystem 81 Servosystem 100	20 – 24 29 – 35 42 – 50 54 – 60 62 – 74 76 – 86 90 – 110	95 95 95 95 95 90 90	160 190 200 210 210 210 210	Servosystem oils are premium quality anti- wear type lubricants formulated with superior quality of hydrotreated base stock. They provide long service life and are recommended for hydraulic and circulation systems of wide variety of equipments. These oils are also used for compressor crankcase lubrication, but are not recommended for lubrication of turbines and equipments having silver-coated components. These oils pass Vickers V-104C vane pump test and meet IS:10522-1983 (Reaffirmed 2004) and IPSS 1-09-002 specifications.
Servosystem BD 46	42 – 50	125	204	Servosystem BD 46 offers excellent biodegradability in addition to excellent load bearing capacity, anti-rust and anti-oxidant properties. It meets CETOP HETG (European Oil Hydraulic and Pneumatic Committee) specification and exceeds the minimum requirement of 70% biodegradability.
Servohydraulic Oil 32 Servohydraulic Oil 46 Servohydraulic Oil 57 Servohydraulic Oil 68 Servohydraulic Oil 100	29 – 35 42 – 50 54 – 60 62 – 74 90 – 110	95 95 95 95 90	190 200 210 210 210	Servohydraulic oils are high quality anti-wear type lubricants recommended for hydraulic systems and a wide variety of circulation systems of industrial equipments. These oils are also used for compressor crankcase lubrication, but are not recommended for lubrication of turbines and equipments having silver-coated components. These oils pass Vickers V-104C vane pump test and meet IS:10522-1983 (Reaffirmed 2004).

04

## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
<b>Circulating Oils (Anti-wear Type)</b> Servosystem 121 Servosystem 150 Servosystem 176 Servosystem 220 Servosystem 320 Servosystem 460	118 – 124 135 – 165 170 – 182 198 – 242 288 – 352 414 – 506	90 90 90 90 90 90	220 230 230 230 230 260	These oils are high quality circulating oils designed for continuous use in circulation lubrication systems for gears and bearings. They provide outstanding performance at the elevated temperature generally found in paper mills, plastic film calendars, coal pulverisers etc., These grades are also recommended for use in compressors, machine tools, hydraulic and circulation systems and enclosed gearboxes, which do not require EP type lubricants.
Servohydraulic Oil 121 Servohydraulic Oil 150 Servohydraulic Oil 220 Servohydraulic Oil 320 Servohydraulic Oil 460	118 – 124 135 – 165 198 – 242 288 – 352 414 – 506	90 90 90 90 90	220 230 230 230 260	These oils are recommended for circulation systems requiring oils with good load bearing capacity in applications such as paper mills, plastic film calendars, coal pulverisers etc. These grades are also recommended for use in compressors, machine tools, hydraulic and circulation systems and enclosed gearboxes, which do not require EP type lubricants.
<b>Special Purpose Hydraulic Oils (Anti-wear type)</b> Servosystem HLP 10 Servosystem HLP 22 Servosystem HLP 32 Servosystem HLP 46 Servosystem HLP 68 Servosystem HLP 100	9 – 11 20 – 24 29 – 35 42 – 50 62 – 74 90 – 110	100 100 100 98 95 95	125 165 200 204 210 210	Servosystem HLP oils are premium hydraulic oils having high FZG rating. These oils meet DIN 51524 Part 2 Denison HF-O US Steel 127, Cincinnati Machines P-69 and P-70 and also IS:10522-1983 (Reaffirmed 2004) and IS:11656-1986 specifications. Servosystem HLP oils are recommended for high performance electro-hydraulic or numerically controlled systems. These oils are extensively used as screw compressor oils also.
Servosystem HLP 32 AF Servosystem HLP 46 AF Servosystem HLP 68 AF	29 – 35 42 – 50 62 – 74	100 98 95	200 204 210	Servosystem HLP AF Oils are ashless type high anti-wear hydraulic oils meeting performance requirements of DIN 51524 Part 2, Cincinnati Machines P-68, 69 & 70 and IS:10522 and IS 11656 specifications. They possess superior demulsibility, thermal and oxidation stability and excellent filterability, essentially required for the equipments working in humid environment.

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
Servosystem HLP 22N Servosystem HLP 32N Servosystem HLP 46N Servosystem HLP 68N Servosystem HLP 100N Servosystem HLP 150N	20 – 24 29 – 35 42 – 50 62 – 74 90 – 110 135 – 165	95 95 95 95 90 90	165 200 204 210 210 230	Servosystem HLP N oils meet the requirements of DIN 51524 HLP (Part 2) and Cincinnati Machines and Vickers Vane pump test requirements. These oils provide good film strength, anti-wear properties to minimise wear in pumps, rings, valves, pistons. These oils have high viscosity index to restrict any viscosity change under continuous operating conditions and resistance to foaming to ensure efficient functioning. Servosystem HLP N oils are recommended for use in hydraulic systems, compressors, pumps, circulation oiling systems, enclosed gearboxes etc.
Servosystem HLP-D 46 Servosystem HLP-D 68	42 – 50 62 – 74	98 95	204 210	Servosystem HLP-D Oils are ashless, antiwear hydraulic oils with emulsifying properties meeting DIN 51524 Part 2 HLP-D specifications. They possess superior emulsifying properties, excellent filtration abilities and superior thermal oxidation stability. They are suitable for high pressure industrial hydraulic oil systems where there are severe chances of water ingress.
Servosystem E 32 Servosystem E 46 Servosystem E 68	29 – 35 42 – 50 62 – 74	100 98 95	200 204 210	Servosystem E oils are premium antiwear hydraulic oils having high FZG rating and meet DIN 51524 Part 2 & Denison HF-O specification requirements. Servosystem E 32 has cleared the severe 35VQ25 test of Eaton Corporation. These oils are recommended for use in Vickers hydraulic systems.
Servosystem XLP 46	42 – 50	100	210	Servosystem XLP 46 is a long life, premium antiwear hydraulic oil (HLP type) exceeding DIN 51524 Part 2 & Denison HF-O requirements. The oil has excellent oxidation stability with D943 life of more than 4000 hours. It is recommended for use in hydraulic systems at Plate mill etc. at Steel plants.

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
<b>Special Purpose High VI Hydraulic Oils (Anti-wear Type)</b> Servosystem HVLP 15 Servosystem HVLP 22 Servosystem HVLP 46 Servosystem HVLP 68	14 – 16 20 – 24 42 – 50 62 – 74	140 140 165 150	125 165 204 200	Servosystem HVLP Oils are all-weather high anti-wear hydraulic oils formulated with superior quality hydro treated base stocks. They have very high viscosity index, very low pour point and excellent low temperature fluidity for use in equipments working at high altitudes and under wide ambient temperature variation. They meet DIN 51524 Part 3 specifications.
Servosystem PGF 15	12.6 – 15.5	398(t)	90	Servosystem PGF 15 is recommended for use in high pressure gauge instruments connected with hydraulic tong cylinders, mud pumps etc. at Oil exploration assets. It possesses superior thermal/oxidation stability, good low temperature rheological property and adequate anti-wear characteristics. The fluid inside the gauge provides for longer movement life and damping out most rig vibrations.
Servohydrex 32 Servohydrex TH 46 Servohydrex 68 Servohydrex 100	29 – 33 43 – 48 65 – 72 100 – 110	160 135 145 130	140 200 200 220	Servohydrex oils are very high viscosity index, anti-wear type hydraulic oils which possess excellent lubrication characteristics. These oils are recommended for very low operating temperature conditions. Servohydrex TH 46 is recommended for Tata Hitachi excavators and Servohydrex 100 is approved by L&T for use in Poclain excavators.
Servohydrex TH 46 Plus	43 – 48	160	200	Servohydrex TH Plus is an anti-wear type hydraulic oil recommended as fluid media in all hydraulic systems where very low operating temperatures are encountered and the application demands use of a very high shear stable viscosity index oils. This grade is recommended as hydraulic fluid for HEMMs including Hitachi Excavators working in Mining area. Tata Steel has approved the use of this oil since it has been able to double its oil drain interval from 2000 hrs to 4000 hrs.

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
<b>Synthetic Hydraulic Oils</b> Servosystem SHC 32 Servosystem SHC 46 Servosystem SHC 68 Servosystem SHC 100	29 – 35 42 – 50 62 – 74 90 – 110	136 135 136 140	230 230 230 230	Servosystem SHC Oils are formulated from synthetic hydrocarbon base fluids and selected additive system. They can be effectively used in severe duty operations under high loads and extreme temperature conditions such as cold start up or very high operating temperatures. They are recommended for high and low pressure gear, vane and piston stationery and mobile hydraulic systems.
Servosystem BD S 46 Servosystem BD S 68	42 – 50 58 - 70	193 184	270 270	Servosystem BD S Oils are anti wear type, synthetic bio-degradable hydraulic oils for applications where contamination due to leakage or blown hydraulic lines present an environmental hazard. They fall under CETOP HEES hydraulic fluid and typically provide a bio-degradability value of more than 80% as per CEC L 33 A 94 test.
<b>Foodgrade Hydraulic Oils</b> Servosystem FG 15 Servosystem FG 32 Servosystem FG 46 Servosystem FG 68	13.5 – 16.5 28 – 36 41 – 52 61 – 75	124 134 135 135	180 220 230 240	Servosystem FG Oils are specially designed synthetic hydraulic fluids for Food Processing Industry. They are formulated with selected synthetic hydrocarbon base oil and additives and are listed by National Sanitary Foundation (NSF) , USA as H1 category food grade lubricants.
Servohylube FG 32 Servohylube FG 46	29 – 35 42 – 50	100 98	185 185	Servohylube FG Oils are mineral oil based food grade, anti-wear type hydraulic oils formulated with selected base oils and additive systems. It meets DIN 51524 Part II specification requirements and is enlisted with NSF, USA as H1 category food grade lubricants.

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	Auto Ignition Temp, °C (type)	Description / Application
<b>Fire Resistant Hydraulic Fluids (Dilute Emulsion Type)</b> Servoaquol 250 Servoaquol 750	55 – 75 115 – 135	– –	Servoaquol oils are oil-in-water type fire resistant hydraulic fluids specifically developed for hydraulically operated mining pit-props. They form stable emulsion with water and give long satisfactory service life in hydraulic systems. Servoaquol 250 and Servoaquol 750 have been developed to meet former National Coal Board, UK specification NCB 463-1981 for grade 18 and grade 19 respectively and also IS:10532 (Part I)- 1983 (Reaffirmed 2004), HF-A Grade 1 and HF-A Grade 2 respectively. Servoaquol 250 and Servoaquol 750 meet the requirements of Director General of Mines Safety, Dhanbad.
Servosystem HFB 68	62 – 74	–	Servosystem HFB 68 is invert emulsion (water-in-oil) type fire resistant hydraulic fluid specially developed for use in hydraulic systems in mining equipments working under severe operating conditions. It imparts fire resistance as well as proper lubrication to hydraulic equipments. It meets IS:10532 (part 2) – 1983 (Reaffirmed 2004), former National Coal Board, UK Specification No.570/1970. It is approved by Director General of Mines Safety, Dhanbad.
<b>Fire Resistant Hydraulic Fluids (Water Glycol Type)</b> Servofyress WG 22 Servofyress WG 46 Servofyress WG 68	19 – 25 41 – 50 61 – 74	468 545 545	Servofyress WG are water glycol based HFC type fire resistant hydraulic fluids. Servofyress WG are highly fire resistant and contain anti-wear additives and a combination of powerful anti-corrosion additives and oxidation inhibitors. These fluids are suitable for use in coal mines where fire resistance is mandatory and are also recommended for forming equipments such as, continuous casting machinery etc.

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	Auto Ignition Temp, °C (type)	Description / Application
<b>Fire Resistant Hydraulic Fluids (Water free)</b> Servofyress HF DU 46 Servofyress HF DU 68	41 – 52 61 – 75	400 400	Servofyress HF DU oils are new generation , HF DU type water free fire resistant hydraulic fluids formulated with synthetic base stocks (Polyether Polyol) and certified additive package meeting the requirements of Factory Mutual Global Certification. These oils possess outstanding anti-wear properties and have inherently good lubricity, high oxidation stability and excellent detergency which contributes to system cleanliness. These oils meet the Spray ignition characteristics and Flame propagation properties as per IS : 7895-1975 (Reaffirmed 2002) .

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	Auto Ignition Temp, °C (type)	Description / Application
Servofyress HFDU 46 ES Servofyress HFDU 68 ES	41 – 52 61 – 74	400 400	Servofyress HFDU ES oils are non-aqueous fully synthetic ester type fire-resistant hydraulic fluids designed for use in high pressure hydraulic equipments operating in possible fire risk areas in manufacturing and mining industry. They have very good anti-wear and anti-corrosion properties, good filterability and air-release value. They are HFDU type fluids as defined by ISO 6743/4 and ISO 12922.
Servofyress HFDR 22 Servofyress HFDR 32 Servofyress HFDR 46 Servofyress HFDR 68 Servofyress HFDR 100	20 – 24 29 – 35 41 – 52 62 – 75 90 – 110	600 568 585 585 585	Servofyress HFDR Oils are triaryl phosphate based fire resistant hydraulic fluids for general industrial applications . These are HFDR type fluids as per ISO 6743/4. They have excellent thermal and oxidation stability for high temperature applications and provide corrosion protection for both ferrous and non ferrous metals. They can be used as hydraulic fluids and high pressure reciprocating air compressor lubricant for high temperature applications. These products are not designed for use in EHC systems of power plants.

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
<b>Spindle Oils</b> Servospin 2 Servospin 5 Servospin 12 Servospin 22	2.0 – 2.5 4.5 – 5 11 – 14 20 – 24	– – 90 90	70 70 144 160	Servospin oils are recommended for bearing lubrication of high speed textile spindles and machine tool spindles. Other applications include timing gears, positive displacement blowers and tracer mechanism and hydraulic systems of precision machine tools. Servospin 10 meets IS:493 Part 2 (Reaffirmed 1993).
Servospin EE 10 Servospin EE 22	9 – 11 20 – 24	90 90	144 160	Servospin EE oils are premium textile machinery oils developed specifically as energy efficient spindle lubricant for the ring frames. Formulated with superior quality hydro treated base stocks these oils offer improved service life and possess superior oxidation/thermal stability. These oils have potential of about 5% power saving. Approved by M/s. Kunal Engineering, LMW etc.
<b>Machinery Oils</b> Servoline 32 Servoline 46 Servoline 68 Servoline 100 Servoline 150 Servoline 220 Servoline 320	29 – 35 42 – 50 62 – 74 90 – 110 135 – 165 198 – 242 288 – 352	– – – – – – –	152 170 180 190 210 220 230	Servoline oils provide good oiliness for general lubrication of machinery even under boundary lubrication conditions. These products maintain a thin film of oil under light and medium loads and provide protection against corrosion and rust even during idle periods. Servoline oils are recommended for all types of industrial machinery using once-through lubrication systems. Also recommended for use in the lubrication systems of machine tools, textile machinery and other machine parts which are lubricated by a thin film of oil. Heavier grades of Servoline oils can be used in the lubrication of small open gears under light duty conditions where oil is applied intermittently by means of an oil can.

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
Servoloom 32 Servoloom 46 Servoloom 68 Servoloom 100 Servoloom 150 Servoloom 220 Servoloom 320 Servoloom 460	29 – 35 42 – 50 62 – 74 90 – 110 135 – 165 198 – 242 288 – 352 414 – 506	– – – – – – – –	152 170 180 190 210 220 230 260	Servoloom Oils are straight mineral lubricating oil formulated for all-loss lubrication system of looms and drives used in textile and jute mills.
Servoloom J32 Servoloom J150 Servoloom J220 Servoloom J320 Servoloom J460	29 – 35 135 – 165 198 – 242 288 – 352 414 – 506		150 210 220 230 230	Servoloom J Oils are general purpose , straight mineral lubricating oil for applications in non-critical all-loss lubricating systems . Products of appropriate viscosities are also used in textile and jute mills for lubrication of looms and other equipments.
Servo Ecofin J	12 – 16		160	Servo Ecofin J is an ecofriendly, bio-degradable Jute Processing Oil. It is recommended for use in conditioning of dry raw jute to impart properties suitable for Jute processing like carding, drawing, spinning, winding, etc. It is having minimum PAH content and hence particularly recommended for use in export market. Servo Ecofin J helps in smooth jute spinning operation due to excellent moisture retention property.

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
<b>Textile Oils (Scourable Type)</b> Servotexshine 68 Servotexshine 100 Servotexshine 150	62 – 74 90 – 110 135 – 165	90 90 90	204 220 230	Servotexshine oils are scourable type of textile oils designed for the lubrication of textile machinery particularly, the looms. These oils are fortified with special additives for providing excellent scourability properties, while imparting anti-rust, anti-foam and anti-wear characteristics. These oils have superior scourability characteristics of 97-99% stain removal as compared to the usual 27% scourability value achieved with the normally used mill lubricants.
<b>Knitting Oil</b> Servoknitclean 12 Servoknitclean 32	11 – 14 29 – 35	115 115	140 160	Servoknitclean Oils are stain -free knitting machinery oils for use in automatic circular knitting machines. They are formulated from light coloured mineral base oils and fortified with selected additive package for guaranteeing superior scourability properties and high anti wear and antirust properties. They provide improved lubrication, improvement in quality of knitted fabrics and can be used through manual as well as mist lubrication devices.
Servoknitclean 22 Plus	19.5 – 24.5		140	Servoknitclean 22 Plus is specially designed to provide excellent scourability performance in both hot and cold wash scouring conditions. Approved by the Textile Committee, Tirupur (Industry of textiles, Govt. of India), it has energy savings potential by following cold wash scouring procedures by the knitting mills.
Servoknitclean BD 32	29 – 35	200	190	Servoknitclean BD 32 is a scourable and biodegradable knitting oils providing effective lubrication during the use. The oil exceeds the Indian and European requirements of minimum 70% biodegradability for ECO MARK.

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
<b>Textile Oils (Biodegradable / Synthetic)</b> Servotexshine BD 68 Servotexshine BD 100 Servotexshine BD 150	64 – 74 90 – 110 135 – 165	– – –	204 220 230	Servotexshine BD oils possess good detergent qualities in addition to excellent oxidation resistance, anti-rust, anti-foam and anti-wear characteristics. These oils are eco-friendly and have 95% biodegradability per CEC-L-33-A-93.
Servosyntex 100	90 – 110	141	220	Servosyntex 100 is a PAO based synthetic circulating oil for use in textile industry. This is a multi-purpose oil for lubrication of gear transmission and bearings in weaving looms. It meets DIN 51517 part 3. Recommended for Sulzer Automatic Weaving Looms.
<b>Anti Static Oil</b> Servotexstat LV 40  Servotex 2152	30 – 40  35 – 45	7.9 – 9.0 (pH value) 8.0 – 9.5 (pH value)		Servotexstat LV 40 and Servotex 2152 are antistatic spin finish oils based on unique chemistries of antistatic agents and essential constituents of lubricating oils. They lower friction between metal and yarn and impart – desired lubricity with antistatic protection to various kinds of fibres during yarn manufacturing, excellent wetting properties , reduced volatility , excellent water dispersibility resulting in stain-free finished yarns / fabric. These oils are used separately or in combination depending on the type of fibres being processed.
<b>Coning Oil</b> Servoconing Oil Servoconing 14	17 – 20 12 – 15	95 111	180 150	These are specially formulated antistatic coning oils. They are recommended for use in Textile Industry as finishing agent. They are high refined, light coloured, low viscosity mineral oil based products containing suitable emulsifier, antistatic, friction reducing and anti-splashing agents to minimize the oil dosage during coning and twisting operation. They provide excellent lubricity to filaments and reduce friction during operation.

## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
<b>Synthetic Chain Lubricant</b> Servochaintex	170 – 190	85	250	Servochaintex is a synthetic chain lubricant specially designed for high temperature chain lubrication. It is based on a unique type of base fluid and additive package. It has excellent oxidation and thermal stability and low volatility ensuring low lubricant consumption. It is recommended for use in Textile machinery like hot air stenter clips, chains & sprockets, paper & leather industry thermic systems and machineries operating under high temperature conditions.
<b>Industrial Gear Oils</b> Servomesh SP 68 Servomesh SP 100 Servomesh SP 150 Servomesh SP 220 Servomesh SP 257 Servomesh SP 320 Servomesh SP 460 Servomesh SP 680 Servomesh SP 1000	62 – 74 90 – 110 135 – 165 198 – 242 250 – 280 288 – 352 414 – 506 612 – 748 900 – 1100	90 90 90 90 90 90 90 90 80	204 204 204 232 232 232 232 232 280	Servomesh SP oils are premium quality industrial gear lubricants having excellent thermal and oxidation stability, good demulsibility, low foaming tendency and provide rust and corrosion protection to metal surfaces. Servomesh SP oils meet AGMA standard 250.04, ASLE standard G-315, G-1000, G-1500, G-2150, IS:8406-1993, US Steel requirement No. 222 and 224 and IPSS:1-09-003 specifications. Servomesh SP 68, SP 100, SP 150, SP 220, SP 320, and SP 460 also meet Cincinnati Machines specifications No. P-63, P-76, P-77, P-74, P-59 and P-35 respectively. Servomesh SP oils are recommended for all heavy-duty enclosed gear drives with circulation or splash lubrication system operating under heavy or shock load conditions up to a temperature of 1000C. These oils can also be used for plain and roller bearings, sliding surfaces, chain drives, sprockets, flexible couplings employing splash, circulation or spray lubrication systems requiring EP type oils.

## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
<b>Energy Efficient Industrial Gear Oils</b> Servomesh EE 150 Servomesh EE 220 Servomesh EE 257 Servomesh EE 320 Servomesh EE 460 Servomesh EE 680	135 – 165 198 – 242 250 – 280 288 – 352 414 – 506 612 – 748	90 90 90 90 90 90	204 232 232 232 232 232	Servomesh EE oils are energy efficient gear oils, which provide reduced friction and thereby reduce power consumption. Recommended for all types of enclosed gear drives, heavily loaded bearings and industrial gears running at high speeds, high pressures, and under impact load. Servomesh EE Gear Oils meet US Steel 224, AGMA 250-04, IS 8406, IPSS 1-09-003, David Brown S1.53.101.
<b>Anti Mircorpitting Gear Oils</b> Servomesh Gold 220 Servomesh Gold 320 Servomesh Gold 460	198 – 242 288 – 352 414 – 506	90 90 90	232 232 232	Servomesh Gold oils are high performance industrial gear lubricants developed to provide maximum protection against conventional wear such as scuffing etc. and resistance against micro pitting fatigue while maintaining compatibility with common gearbox seal materials. These oils meet the requirement of DIN 51517 CLP ( Part III) & have the technical approval of Siemens for Flender Gear units under Revision 13. Recommended for lubrication of helical, bevel & planetary type of Gear units.
Servomesh Plus 100 Servomesh Plus 150 Servomesh Plus 220 Servomesh Plus 320 Servomesh Plus 460 Servomesh Plus 680 Servomesh Plus 1000	90 – 110 135 – 165 198 – 242 288 – 352 414 – 506 612 – 748 900 – 1100	90 90 90 90 90 90 80	204 204 232 232 232 232 280	Servomesh Plus Oils are advanced extreme pressure type industrial gear lubricants specially formulated to protect heavily loaded gears against micropitting. They meet performance requirement of Flender AG, AGMA 9005-D95, US Steel 224, DIN 51517 CLP, David Brown S1.53.101, SEB 181-226. They provide extended component life, excellent wear protection and improved protection from micropitting fatigue.

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
Servomesh XP 320	288 – 352	90	230	Servomesh XP 320 is an anti micro pitting oil with higher load bearing capacity (FZG>14) than conventional gear oils. It has been developed for use in heavy-duty enclosed gear drives with circulation or splash lubrication system operating under heavy or shock load conditions such as those in Steel plants.
<b>Synthetic Gear Oils</b> Servosyngear 100 Servosyngear 150 Servosyngear 220 Servosyngear 320 Servosyngear 460 Servosyngear 680 Servosyngear 3200	90 – 110 135 – 165 198 – 242 288 – 352 414 – 506 612 – 748 2900 – 3500	140 140 140 145 145 145 286	220 220 220 220 220 220 220	Servosyngear oils are synthetic gear oils made of PAO based fluids and selected additives. They have excellent wear, corrosion and rust protection properties and enhanced oxidation stability. Their natural high VI combined with low traction co-efficient reduce power consumption and make them energy efficient gear oils. They provide long equipment life. Servosyngear 3200 is specially developed for heavy duty traction gear cases of GE Locomotives.
Servosyngear HVI 100 Servosyngear HVI 220 Servosyngear HVI 320 Servosyngear HVI 460 Servosyngear HVI 680 Servosyngear HVI 1000	90 – 110 198 – 242 288 – 352 414 – 506 612 – 748 950 – 1150	200 220 220 220 220 250	250 250 250 250 250 250	Servosyngear HVI Oils are Polyalkylene Glycol base synthetic gear lubricants having inherent high viscosity index and excellent thermal and oxidation stability. They are specially recommended for worm gear lubrication and are excellent lubricants for all types of gears, anti-friction and plain bearings working under most severe conditions such as those in blast furnaces of Steel plants.
Servosyngear 150 SF Servosyngear 320 SF Servosyngear 1000 SF	135 – 165 290 – 350 900 – 1100	135 135 135	220 220 260	Servosyngear SF Oils are synthetic hydrocarbon base industrial gear and bearing oils designed to provide outstanding performance in extreme service applications at high and low temperatures. They are compatible with bronze and provide better high temperature oxidation stability, antiwear properties, protection against rust and corrosion, extended oil life and reduced power consumption. Servosyngear 150 SF is specially recommended for lubrication of comber gear box in Textile industry. Servosyngear 1000 SF is recommended for anti-friction bearings of grinding rollers in cement mills.

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
Servosyngear 320 RR Servosyngear 460 RR	288 – 352 414 – 506	145 147	220 230	Servosyngear RR is a new technology synthetic type industrial gear oil recommended for heavily loaded worm gear systems working at elevated temperatures. It has high thermal stability and provides reduced wear, increased oil life and excellent resistant to oxidation and aging.
<b>Anti-Micropitting Synthetic Gear Oils</b> Servosyngear 320 Plus Servosyngear 460 Plus Servosyngear 680 Plus	288 – 352 414 – 506 612 – 748	145 145 150	240 240 240	Servosyngear Plus Oils are synthetic industrial gear lubricants which provide higher protection from micropitting fatigue. They have excellent thermal and oxidation stability and provide extra protection against wear, rust and corrosion. They are recommended for lubrication of gears working under heavy or shock load conditions and which may be subjected to micropitting. Their natural high VI and low pour point make them suitable for continuous all weather applications. Servosyngear Plus are approved by Flender against specification 06/12/2005/REV.9 and are suitable for wind mill gear boxes.
Servosyngear AMP 320 Servosyngear AMP 460	288 – 352 414 – 506	160 155	230 230	Servosyngear AMP Oils are fully synthetic industrial gear oils designed to provide optimum equipment protection and oil life under extreme conditions of load and temperature. They are specially recommended for applications that may be subjected to micropitting especially highly loaded units and extreme temperature environments. These can be used for lubrication of plastic extruder boxes and modern highly loaded gear boxes used in paper, steel, oil, textile and cement industries. They meet DIN:51517 Part 3 for CLP fluids. Servosyngear AMP are approved by Flender against Specification of 06/12/2005/REV.9 and are suitable for wind mill gear boxes.

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
<b>Synthetic Bio-degradable Gear Oil</b> Servosyngear BD 150 Servosyngear BD 220	135 – 165 200 – 240	148 144	230 250	Servosyngear BD Oils are polyol ester based gear and circulating system lubricants, designed to lubricate spur, helical and planetary gear units, couplings, rolling and sliding bearings in applications where the use of mineral oil based lubricants pose certain environmental risks such as in off-shore installation.
<b>Foodgrade Gear Oils Mineral Oil based</b> Servomesh FG 68 Servomesh FG 100	64 – 72 90 – 110	90 90	204 204	Servomesh FG Oils are formulated with specially selected white mineral oil fluids and foodgrade additives to meet NSF H-1 approval requirements. They possess excellent demulsibility, metal compatibility and good anti-wear properties required for food processing gear systems. These products are approved from M/s. NSF-USA.
<b>Synthetic Oil based Foodgrade Gear Oils</b> Servosyngear FG 220 Servosyngear FG 320 Servosyngear FG 460 Servosyngear FG 680	198 – 242 288 – 352 414 – 506 612 – 748	140 144 147 154	240 240 258 240	Servosyngear FG Oils are high performance industrial gear oils specially developed for the lubrication of enclosed gears in food processing machineries. Blended with specially selected synthetic fluids and additives, these products are listed by National Sanitary Foundation (NSF), USA under category H1 for use where there is potential of incidental food contact.
<b>Synthetic Paper Machinery Lubricants</b> Servosyn PM 220 Servosyn PM 320 Servosyn PM 460	198 – 242 288 – 352 414 – 506	135 135 140	230 230 230	Servosyn PM oils are specially formulated synthetic circulating oils for longer protection of bearings and gears of machineries used in paper mills under severe operating conditions. It provides outstanding protection against rust and corrosion, excellent lubricity, superior thermal and oxidation stability and longer oil life.

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
<b>Oil Mist Lubricants</b> Servomist Lube 220 Servomist Lube 320 Servomist Lube 460	210 – 230 288 – 352 425 – 500	90 90 90	232 232 232	Servomist Lubes are premium quality oil mist lubricants with excellent film strength, and thermal-oxidation stability characteristics. They are designed to exhibit good misting properties as required in oil mist lubricant systems for industrial gear applications.
<b>Synthetic Chain Lubricants</b> ServoCHAINLUBE S 135 ServoCHAINLUBE S 220	130 – 145 198 – 242	106 100	290 300	ServoCHAINLUBE S Oils are specially formulated synthetic product for lubrication of bearings, chains, slides and gears in industrial applications where air temperature often exceeds 260 deg C. They are suitable for use in ceramic paint, fiber glass plants, foundries steel mills, automotives plants, paper, rubber, textile industry etc.
<b>Foodgrade Chain Lubricants</b> ServoCHAINLUBE FG 150 ServoCHAINLUBE FG 220	135 – 165 200 – 240	149 151	230 230	ServoCHAINLUBE FG Oils are specially designed, fully synthetic anti-wear chain oils for lubrication of drive and transport change in the food processing industry. Blended from selected synthetic fluids and additives, they are listed by National Sanitary Foundation (NSF), USA as category H1 Lubricant for use where there is potential of incidental food contact.

## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
<b>Oil Film Bearing Oils</b>				
Servofilm 5	4 – 6	–	125	Servofilm oils have good oxidation and thermal stability and excellent ability to separate from water and meet IPSS 1-09-001-81. They are non-corrosive and are recommended for oil film bearings in steel mills and in circulation systems, where an non-additive type oil is required to obtain higher demulsibility and air release characteristics.
Servofilm 10	9 – 11	95	150	
Servofilm 12	11 – 13	95	160	
Servofilm 15	13 – 17	95	160	
Servofilm 32	29 – 35	95	194	
Servofilm 46	42 – 50	95	194	
Servofilm 68	62 – 74	95	204	
Servofilm 100	90 – 110	90	216	
Servofilm 150	135 – 165	90	230	
Servofilm 220	198 – 242	90	230	
Servofilm 320	288 – 352	90	232	
Servofilm 460	414 – 506	90	240	
Servofilm 40 CL	36 – 44	95	200	
<b>Morgan Bearing Oils</b>				
Servosteel 220	198 – 242	90	230	Servosteel oils are premium quality bearing oils possessing superior oxidation and thermal stability. These oils separate from water quickly and have excellent film strength property to minimise wear in roll-neck bearings of steel mills. Servosteel oils meet requirements of Morgoil bearing lubricant specified by Morgan Construction Co., U.S.A. These oils fully meet performance requirements of IPSS:1-09-001-81.
Servosteel 257	250 – 280	90	232	
Servosteel 320	288 – 352	90	250	
Servosteel 381	370 – 400	90	262	
Servosteel 460	414 – 506	90	262	
Servosteel 521	500 – 550	90	280	
Servosteel 680	612 – 748	85	240	

## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
Servosteel 220 Plus Servosteel 257 Plus Servosteel 320 Plus	198 – 242 255 – 265 288 – 352	95 95 95	230 232 250	Servosteel Plus oils are superior quality Non-EP type steel mill bearing oils which provide outstanding water separation, good resistance to thermal degradation and oxidation and protection against rust and corrosion. They meet the advanced Morgan Specification requirement (of March 2002) and also IPSS:1-09-001-81.
Servosteel EP 100 Servosteel EP 150 Servosteel EP 220 Servosteel EP 381 Servosteel EP 460	90 – 110 135 – 165 198 – 242 370 – 400 414 – 506	95 90 90 90 90	220 230 230 230 262	Servosteel EP oils are premium quality, extreme pressure, bearing and circulating oils which have very good load bearing ability in addition to excellent demulsibility characteristics. Servosteel EP oils are recommended for use in no-twist-rod mills and also in applications where severe load conditions are encountered.
Servosteel EP 100 Plus Servosteel EP 150 Plus Servosteel EP 220 Plus	90 – 110 135 – 165 198 – 242	95 95 95	220 230 230	Servosteel EP Plus oils are heavy duty bearing and circulating oils developed specially for the lubrication of bearings and gear boxes of 'Wire Rod' Mills. Formulated with superior hydro treated base oils and ashless additives, these oils meet the Morgoil Advanced Lubricant new oil revision 2.1 March 2002 specification including dynamic demulsibility endurance tests requirement. Servosteel EP Plus Oils possess high oxidation stability, superior anti wear characteristics and provide good protection against rust and corrosion.
<b>Compressor Oils</b> Servopress 32 Servopress 46 Servopress 68 Servopress 100 Servopress 150 Servopress 220 Servopress 320	29 – 35 42 – 50 62 – 74 90 – 110 135 – 165 198 – 242 288 – 352	95 95 95 95 95 90 90	196 200 204 210 220 230 250	Servopress oils are specially developed compressor oils, formulated with superior hydro treated base stocks, to provide satisfactory lubrication under prolonged high temperature and load conditions. These oils meet the requirement of DIN 51506 VD-L group and ISO DIS-6521 specifications for air compressor oil. Servopress oils are excellent cylinder lubricants for high performance reciprocating and rotary air compressors and can be used up to 2200C air discharge temperature.

## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
Servopress FG 46 Servopress FG 68	42 – 50 62 – 74	90 90	204 204	Servopress FG Oils are industrial compressor oils for food processing industry and are registered with NSF, USA as H1 category of food grade lubricants. They possess superior thermal; oxidative stability, good metal compatibility and low carbon forming tendency.
Servopress 100 RR Servopress 150 RR	90 – 110 135 – 165	95 95	210 220	Servopress RR oils are specially formulated air compressor lubricants having superior thermal and oxidation stability, better water separation ability, and high load carrying capacity. They minimise carbon deposit and wear under prolonged high temperature and load conditions. They also provide extended oil service life and reduced oil consumption. Servopress 100 RR and 150 RR are recommended by RDSO for compressor lubrication in GM EMD Locos and expressor lubrication in ALCO locos respectively.
Servopress T 32 Servopress T 46 Servopress T 57 Servopress T 68	29 – 35 42 – 50 54 – 60 62 – 74	100 98 95 95	215 215 215 215	Servopress T oils are formulated with superior hydro treated base stocks and have good demulsibility property and low deposit and sludge forming tendency. Servopress T oils meet the specific requirement of ammonia oxidation and air blow test and are recommended for lubrication of ammonia and syn-gas centrifugal and screw type compressors.
Servopress C 100 Servopress C 220	90 – 110 198 – 242	90 90	192 222	Servopress C oils are compounded to give excellent resistance to washing action of water. These oils provide excellent protection against rust and corrosion and have good fluidity at low temperatures. Servopress C oils are recommended for cylinder lubrication of single and multi stage air compressors handling moist air. These oils form stable emulsion with water and provide excellent lubrication of cylinder liners, piston rings, valves etc. Servopress C oils are not recommended for crankcase lubrication.



## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
Servopress LS 220 Servopress LS 320 Servopress LS 460	198 – 242 288 – 352 414 – 506	90 90 90	220 226 260	Servopress LS oils are specially developed low sulphur (0.25% wt. max.) oils for cylinder lubrication of high pressure syn-gas reciprocating compressors. These oils minimise wear of cylinder liners and rings and ensure long life of the catalyst.
Servopress 46XL  Servopress 68XL	43 – 48  62 – 74	95  95	204  204	Servopress XL oils are high performance rotary screw compressor oils specially developed to provide extended drain intervals against conventional compressor fluids when used under normal conditions. These oils provide improved thermal and oxidation stability over a wide range of temperatures, reduced carbon forming tendency & reduced volatility.
<b>Semi-synthetic Compressor Oil</b> Servopress SS 68	62 – 74	127	210	Servopress SS 68 is Semi-synthetic compressor oil consisting of PAO and superior quality mineral base oil and additives. The product exhibits superior high temperature performance characteristics and oxidation stability to that of conventional mineral base oil formulation.

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Pour Point , °C Max.	Flash Point COC, °C Min.	Description / Application
<b>Synthetic Compressor Oil</b> Servosynco 270	265 – 280	200	(-) 3	220	Servosynco 270 is a PAG based synthetic compressor oil having high viscosity index and natural anti-wear properties. Servosynco 270 is intended to be used in once through lubrication of cylinders of compressors handling petrochemicals such as polyethylene with operating pressure of 4000 bar in the hyper stage compressor.
Servosynco E 32 Servosynco E 46 Servosynco E 68 Servosynco E 100 Servosynco E 150 Servosynco E 220	29 – 35 42 – 50 62 – 74 90 – 110 135 – 165 198 – 242	130 142 150 153 158 161	(-) 42 (-) 45 (-) 42 (-) 39 (-) 30 (-) 30	210 210 210 210 210 220	Servosynco E oils are specially designed PAO based synthetic, long drain compressor oils for high pressures air compressors. They provide excellent lubricity and low oil consumption rate. Due to lower pour point, these oils offer scope for use at lower ambient temperatures with easy startability. Moreover, due to higher flash point and auto ignition temperature compared with conventional petroleum oils, Servosynco E Oils enhance safety factor.
Servosynco PS 320	295-345	105	(-) 15	226	Servosynco PS 320 is a semi-synthetic compressor fluid with very low sulphur (0.2% wt. max.) developed for cylinder lubrication of high pressure syn-gas reciprocating compressors. These oils exhibit minimal wear of cylinder liners and rings and ensure long life of the catalyst.
Servosynco DE 32 Servosynco DE 68 Servosynco DE 100 Servosynco DE 150	29 – 35 62 – 74 90 – 110 135 – 165	121 67 57 67	(-) 39 (-) 21 (-) 21 (-) 18	230 230 230 230	These are Diester based synthetic compressor oils, recommended for single and multi-stage air compressors and once through cylinder lubrication. These are particularly effective for continuous high temperature applications with discharge temperature upto 200°C with minimum deposit formulation. They have built-in detergency properties which results in longer lasting air compressor parts and reduced oil separator varnishing and sticking of air compressor valves.

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Pour Point , °C Max.	Flash Point COC, °C Min.	Description / Application
Servosynco PE 32 Servosynco PE 46 Servosynco PE 68 Servosynco PE 100 Servosynco PE 150 Servosynco PE 220	29 – 35 42 – 50 62 – 74 90 – 110 135 – 165 200 – 242	133 118 106 103 110 87	(-) 48 (-) 39 (-) 33 (-) 21  (-) 15	246 252 254 270 270 270	These are Polyol ester based fully synthetic compressor oils designed to lubricate reciprocating air compressors working under severe operating conditions, air discharge temperature exceeding 200°C and rotary compressors. These oils possess superior oxidation stability, reduced carbon deposits tendency, high flash point and low volatility.
Servosynco AN 32 Servosynco AN 46 Servosynco AN 68 Servosynco AN 100	29 – 35 40 – 52 62 – 74 90 – 110	131 144 149 150	(-) 42 (-) 42 (-) 39 (-) 36	220 220 230 230	Servosynco AN Oils are formulated by a synthetic blend of PAO and Alkylated Naphthalenes. This product provide improved thermal and oxidation stability compared to PAO based compressor oils.
Servocryo SHC 32	29 – 35	130	(-) 54	220	Servocryo SHC 32 is fully synthetic compressor oil specially developed for application in aluminium industry. Has inherent high viscosity index, excellent low temperature fluidity and high thermal and oxidation stability. Provides excellent performance in applications such as billet casting in Aluminium Industry.
Servocress 68 Servocress 100 Servocress 150 Servocress 220	61 – 75 90 – 110 135 – 165 198 – 242	210 210 220 230	(-) 36 (-) 33 (-) 36 (-) 30	215 215 215 220	Servocress oils are fully synthetic compressor oils for lubrication of LPG & other hydrocarbon gas compressors working under sub-zero temperature. These oils possess high viscosity index and anti-wear properties. These products have special capability to resist dilution with hydrocarbon gases.
Servosynco SS 68 Servosynco SS 100	60 – 75 90 – 110	124 128	(-) 24 (-) 24	230 230	Servosynco SS oils are Semi-synthetic compressor oil consisting of PAO and superior quality mineral base oil and additives. The product exhibits superior high temperature performance characteristics and oxidation stability to that of conventional mineral base oil formulation.

## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Pour Point , °C Max.	Flash Point COC, °C Min.	Description / Application
<b>Food Grade Compressor Oils</b> Servosynco FG – H1 32 Servosynco FG – H1 46 Servosynco FG – H1 68 Servosynco FG – H1 100	28 – 36 40 – 52 60 – 75 90 – 110	135 131 131 132	(-) 45 (-) 42 (-) 39 (-) 39	220 250 250 250	Servosynco FG – H1 Oils are compressor oils for food processing industry and are registered with NSF, USA as H1 category of food grade lubricants.

## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	Pour Point , °C Max.	Flash Point COC, °C Min.	Description / Application
<b>Refrigeration Compressor Oils</b> Servofriz 12 Servofriz 22 Servofriz 32 Servofriz 46 Servofriz 68 Servofriz 100	11 – 14 20 – 24 29 – 35 42 – 50 62 – 74 90 – 110	(-) 39 (-) 45 (-) 30 (-) 27 (-) 24 (-) 24	144 150 158 164 174 200	Servofriz oils possess high fluidity at very low temperature, resist deposit formation and have reduced tendency to foam. These oils ensure high condenser efficiency and reduced compressor valve maintenance due to less deposits. These oils meet IS:4578-1989 specification. Servofriz 68 also meets Carrier Corporation, U.S.A. specification PP 46-1. Servofriz oils are recommended for a wide range of refrigeration compressors using all conventional refrigerants (CFCs) except sulphur dioxide and are suitable for both reciprocating as well as rotary compressors.
Servofriz F 32 Servofriz F 46 Servofriz F 57	29 – 35 42 – 50 54 – 60	(-) 36 (-) 27 (-) 24	158 164 168	Servofriz F 32, F 46 and F 57, apart from having the characteristics of Servofriz oils have very low Freon Floc Points i.e. (-) 450C, (-) 400C and (-) 400C respectively. These oils are recommended for the lubrication of hermetically sealed refrigeration compressors.
Servofriz NH 32	29 – 35	(-) 27	150	Servofriz NH 32 contains a special additive to impart antiwear and rust protection characteristics and is recommended for cylinder lubrication of refrigeration compressors, with ammonia as refrigerant requiring a low pour anti-wear oil.
Servofriz NH 68	62 – 74	(-) 24	170	Servofriz NH 68 is a specially blended refrigeration compressor oil with ammonia as refrigerant for use in ice plants and cold storages.
<b>Semi-Synthetic Refrigeration Compressor Oils</b> Servofriz S 22 Servofriz S 32 Servofriz S 46 Servofriz S 57 Servofriz S 68 Servofriz S 150	20 – 24 29 – 35 42 – 50 54 – 60 62 – 74 135 – 165	(-) 45 (-) 30 (-) 27 (-) 24 (-) 24 (-) 24	144 154 160 164 170 225	Servofriz S oils are premium lubricants having low pour point and meet the lubrication requirement of reciprocating and rotary refrigeration compressors. Servofriz S oils are recommended for use with all fluorocarbon refrigerants and with hydrocarbons and ammonia in refrigeration and air conditioning applications where the evaporation temperatures are lower than the pour point of the oil.

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	Pour Point , °C Max.	Flash Point COC, °C Min.	Description / Application
<b>Synthetic Refrigeration Oils</b> Servofriz SHC 68 Servofriz SHC 100 Servofriz SHC 220	62 – 74 90 – 110 200 – 240	(-) 42 (-) 39 (-) 33	250 250 250	Servofriz SHC Oils are fully synthetic refrigeration oils designed for use in industrial refrigeration systems using R 12, R 22, ammonia and carbon dioxide as refrigerants. They provide outstanding lubrication, improved antiwear protection, excellent thermal and oxidation characteristics and longer oil life.
Servofriz SHC FG 68	62 – 74	(-) 42	250	This is a synthetic food grade refrigeration oil recommended for use in refrigeration compressor systems where chances of incidental food contact is there. Recommended for use with R22, CO2 and ammonia refrigerants.
<b>Eco-friendly Synthetic Refrigeration Oils</b> Servofriz Car 46 Servofriz Car 68 Servofriz Car 80	41 – 50 64 – 74 72 – 88	(-) 39 (-) 39 (-) 36	200 200 200	Servofriz Car oils are environment friendly synthetic refrigeration fluids for automobile air conditioning compressors using R134a as refrigerant. These oils exhibit very good miscibility with R-134a and provide superior lubricity.
Servofriz ECO 10 Servofriz ECO 22 Servofriz ECO 32 Servofriz ECO 46 Servofriz ECO 68 Servofriz ECO 100 Servofriz ECO 150 Servofriz ECO 170 Servofriz ECO 220 Servofriz ECO 320	9 – 11 19 – 25 28 – 36 42 – 50 62 – 74 90 – 110 135 – 165 165 – 185 198 – 242 288 – 352	(-) 51 (-) 42 (-) 39 (-) 36 (-) 27 (-) 24 (-) 18 (-) 18 (-) 15 (-) 12	175 190 190 210 230 230 230 250 250 250	Servofriz ECO oils are ester based environment friendly, fully synthetic refrigeration oils designed specifically for lubrication of refrigeration compressors and systems using ozone friendly HFC refrigerants. These are miscible with R 134a refrigerants. Provide improved lubricity and wear protection. Recommended for use in domestic refrigeration, air conditioning and industrial refrigeration systems using HFCs and R 22 as refrigerants.

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Pour Point , °C Max.	Flash Point COC, °C Min.	Description / Application
<b>Stationary Diesel Engine Oils</b> Servolube 68 Servolube 100 Servolube 150 Servolube 220	62 – 74 90 – 110 135 – 165 198 – 242	90 90 90 90	(-) 6 (-) 6 (-) 6 (-) 3	210 216 224 228	Servolube oils are non-detergent type stationary diesel engine oils, recommended for lubrication of slow and medium speed stationary diesel engines where operating conditions do not require a detergent oil. These oils are also found to give satisfactory performance in the lubrication of reciprocating air compressors.
<b>Vacuum Pump Oils</b> Servovacuum VM 4	47 – 58 @ 50°C	95	(-) 15	230	Servovacuum VM 4 is a specially developed product having low vapour pressure (1 x 10 <sup>-6</sup> mm of Hg at 200C) and high thermal stability. It meets GOST:23013-78 specification for vacuum pump oil and is recommended for high vacuum producing diffusion pumps.
<b>Synthetic Vacuum Pump Oils</b> Servovacuum SHC 46 Servovacuum SHC 68 Servovacuum SHC 100	42 – 50 62 – 72 90 - 110	130 130 141	(-) 45 (-) 45 (-) 27	235 235 220	Servovacuum SHC oils are fully synthetic vacuum pump oils specially developed for modern industrial applications which require extremely low vacuums. These oils possess low volatility, low pour point, good anti-wear and frictional characteristics and provide steady vacuum.
<b>Gas Holder Oils</b> Servoseal G 46 Servoseal G 81 Servoseal G 100	42 – 50 77 – 86 100 – 120	90 90 95	(-) 15 (-) 15 (-) 15	200 204 204	Servoseal oils have been developed as a sealant for the gas holders in the steel industry and specially formulated to be compatible with the material of construction of the gas holders and the seals. Servoseal protect the metal surfaces from rust and corrosion and are unaffected by the gas holder gases. These oils pass the stringent MAN test for water separating characteristics.

## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Pour Point , °C Max.	Flash Point COC, °C Min.	Description / Application
<b>Pneumatic Tool Oils</b> Servoneum 100 Servoneum 181 Servoneum 220	90 – 110 176 – 186 198 – 242	90 90 90	(-) 9 (-) 9 (-) 9	194 200 230	Servoneum oils have excellent load carrying ability and rust preventive properties. Servoneum oils maintain oil protective films both at low and high pressure and do not give obnoxious odour even with equipment operating in confined spaces. These oils are used for lubrication of pneumatic equipment such as rock drill, jack hammers, chippers, wagon drills etc., and are also used in small in-plant pneumatic tools like grinders, filing tools, drills, tappers, impact wrenches etc.

## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
<b>Machine Tool Way Oils</b> Servoway 32 Servoway 68 Servoway 100 Servoway 220	29 – 35 62 – 74 90 – 110 198 – 242	– – – –	160 170 170 190	Servoway oils have tackiness, anti-rust and anti-foam additives enabling higher loading of machine tools, minimum stick-slip and chatter, and provide improved surface finish to the job. These oils protect parts against rust and corrosion and reduce oil consumption due to good adhesive characteristics. Servoway 68 and 220 meet ASLE standard W 315 and W 1000 as well as Cincinnati Machines specifications P-47 and P-50 respectively. These oils are excellent products for slide way lubrication of planers, grinders, horizontal boring machines, shapers, jig borers etc., involving high precision work and are also recommended for lubrication of gears by oil-can.
<b>Hydraulic-cum-Machine Tool Way Oils</b> Servoway H 32 Servoway H 57 Servoway H 68	29 – 35 54 – 60 62 – 75	90 90 90	194 198 200	Servoway H oils are combined hydraulic and machine way lubricants. These oils possess adequate lubricity to eliminate stick-slip and chatter under moderate load conditions and at the same time serve as hydraulic media in non-critical systems. Servoway H 32 meets ASLE standard W 150 and Cincinnati Milacron specification P-53. These oils are exclusively recommended for machine tools, which have combined hydraulic and way lubrication systems. Servoway H oils are not recommended for critical hydraulic systems or as a substitute for Servoway oils.
<b>Steam Cylinder Oils</b> Servocyl C 460 Servocyl C 530 Servocyl C 680 Servocyl C 800	414 – 506 520 – 560 612 – 748 720 – 880	90 90 85 85	280 280 280 280	Servocyl C oils are compounded type steam cylinder oils having excellent oiliness and film strength properties. These oils resist water washout and minimise deposit formation even at elevated temperatures. Servocyl C oils are recommended for steam engines operating under wet/ saturated steam conditions. These oils are widely used in calendar bearings and sugar mill roll bearings and are also recommended for lubrication of worm gears. These oils are not suitable for applications, where the steam condensate is re-used.

## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
Servocyl M 680 Servocyl M 1000 Servocyl M 1500	612 – 748 900 – 1100 1300 – 1650	85 80 80	280 280 280	Servocyl M oils have excellent chemical and thermal stability and load carrying ability. These oils reduce steam consumption due to good sealing characteristics and minimise frictional losses. These oils are recommended for cylinder lubrication of steam engines handling superheated steam, where the condensate is separated from oil and re-used for process work. Servocyl M oils are not suitable for wet steam conditions. These oils are also used in oil tempering and wire drawing applications with satisfactory results.
<b>Sugar Mill Roll Bearing Oils</b> Servo SM 85  Servo SM 175  Servo SM 260	38 – 45 at 100°C  78 – 88 at 100°C  120 – 130 at 100°C	–  –  –	130  130  130	Servo SM oils meet the lubrication requirements of heavily loaded mill roll bearings in sugar mills. These oils ensure efficient lubrication even in the presence of cane juice. These oils prevent wear and corrosion of bearings and have excellent resistance to leakage. Servo SM oils are also recommended in centralised lubrication systems of slow speed spur and helical gears in certain industries and for open gear lubrication by slush pan method.
Servo SM 85 (NB)  Servo SM 120 (NB)	38 – 45 at 100°C  58 – 64 at 100°C	–  –	230  230	Servo SM(NB) Oils are non-bituminous, specially formulated from selected lube base oils and containing non-toxic mild EP additives to meet the requirements of heavily loaded, slow speed, roll bearings of sugar mills. They provide excellent lubrication and prevent wear and corrosion of bearing under all operating conditions.

## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
Servo SM Syn 1000	950 – 1150 at 100°C	–	230	This 'bitumen free' product has been developed for lubrication of Sugar mill bearings. It is based on special polymers which provide high tackiness, resistance to water wash out and good sealing against entering of juice/bagasse.
<b>Bearing Oils (Compounded Type)</b> Servoshaft 150 Servoshaft C 150	135 – 165 135 – 145	– –	204 192	Servoshaft oils are specially developed for the lubrication of exposed parts subjected to excessive water wash in marine and industrial applications. Servoshaft oils are used in plain bearings, gears and slides of steam engines, punch presses, etc., where conventional oils are generally found inadequate. These oils are also recommended for certain wire drawing applications. Servoshaft C 150 is having compounding agent to improve load bearing characteristics and resistance to leakage of oil.
<b>Open Gear Compounds</b> Servocoat 110 Servocoat 120 Servocoat 140 Servocoat 170 T Servocoat 190	80 – 120 200 – 250 400 – 550 740 – 810 900 – 1100	– – – – –	250 250 280 280 280	Servocoat are open gear compounds having good load carrying ability and are recommended for open gear, wire rope and chain drive lubrication. Servocoat compounds are also for the lubrication of kiln tyres operating at high temperature in cement mills and chemical plants. These compounds should not be used in food processing industries. Servocoat 170 T has special tackiness additive and has been developed specifically to meet the requirements of Indian Railways.

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## INDUSTRIAL OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
<b>Special Open Gear Compound</b> Servotak 40  Servotak 40 NC	1400 – 1600  1400 – 1600	–  –	–  –	Servotak 40 is an open gear compound of bituminous base containing a non-inflammable diluent. It has good load carrying ability. This compound has a low pour point (-)120C, which makes it suitable for use in low ambient temperature conditions. It is recommended for open gears working under heavy and shock loads and varying temperature conditions. Servotak 40 forms a strong adhesive film on the metal surface, which does not get squeezed out during usage and does not get hardened or chipped off under low temperature conditions. Servotak 40 NC contains non-chlorinated non inflammable dilutant .
Servo Gear Compound 30	575 – 625 at 50°C	–	–	Servo Gear Compound 30 provides excellent film strength and load bearing ability to withstand high pressure encountered in heavily loaded open gears. This grade is recommended for lubrication of girth gears, open gears, cable and wire ropes. It is widely in use in various mining industries.
<b>General Purpose Machinery oils</b> Lubrex 22 Lubrex 32 Lubrex 46 Lubrex 68 Lubrex 100 Lubrex 150 Lubrex 220 Lubrex 320 Lubrex 460	19 – 24 29 – 35 42 – 50 62 – 74 90 – 110 135 – 165 198 – 242 288 – 352 414 – 506	– – – – – – – – –	150 150 160 160 170 204 220 220 240	Lubrex oils are normally recommended for non-critical all loss lubrication systems and hand oiling applications involving lubrication of bearings, open gears, lightly loaded slides and guide ways of machine tools. Lubrex oils of appropriate viscosity are widely used in textile mills for lubrication of looms and other equipments, which do not require additive treated oils. These oils can also be used as fluid sealing medium for gas holder where the gases do not react with mineral oils and as filter media in oil-bath type air cleaners. Lubrex 22 is recommended for flushing of automotive and industrial equipments. The characteristics of Lubrex 22 make it possible to easily clean all inaccessible internal surfaces of various equipments.

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## INDUSTRIAL LUBRICATING OILS

PRODUCT	Kin. Viscosity cSt at 40°C	VI Min.	Flash Point COC, °C Min.	Description / Application
<b>Axle Oils</b> IOC Roel 280  IOC Roel 320	76 – 86 at 60°C 90 – 103 at 60°C	40 –	160 PMCC 180 PMCC	IOC Roel oils have good inherent oxidation stability, thereby ensuring long service life. These oils fully meet IS:1628-1986 (Second Revision) Reaffirmed 2002 specifications for axle oils. IOC Roel oils are used by Railways and Steel Plants for lubrication of plain bearings, axle boxes of locomotives, wagons and other rolling stock due to very good load bearing and anti-wear properties.

## INDUSTRIAL GREASES

PRODUCT	Colour	Worked Penetration at 25 deg C after 60 strokes	Drop Point deg C Min.	Description / Application
<b>General Equipment &amp; Machinery Greases</b> Servogem 2 Servogem 3	Light Brown Light Brown	265 – 295 220 – 250	180 180	Servogem 2 and 3 are multipurpose greases recommended for anti-friction and plain bearings lubrication. Servogem 2 and 3 meet the requirement of British Timken ALG bearing 1/57, IS:7623-1993 (Second Revision) Reaffirmed 2001, IPSS:1-09-006-1997 specifications and U.S. Steel 374 requirement. These greases are widely used in steel plants, heavy engineering units, textile mills, petrochemical and chemical units etc.
Servogem EP 000 Servogem EP 00 Servogem EP 0 Servogem EP 0 (N) Servogem EP 1 Servogem EP 2 Servogem EP 2 (C) Servogem EP 2 (S) Servogem EP 2X	Brown Brown Brown Dark Brown Brown Dark Brown Brown Dark brown Brown	445 – 475 400 – 430 355 – 385 355 – 385 310 – 340 265 – 295 280 – 300 285 – 305 265 – 295	160 170 180 190 180 180 100 180 180	Servogem EP greases possess extreme pressure (EP) properties and prevent welding and seizure of moving parts often caused by shock loading. Servogem EP greases meet IPSS:1-09-005-1999 and IS:7623-1993 (Second Revision) Reaffirmed 2001, specification. These greases are recommended for both plain and anti-friction bearings in a wide variety of applications such as automotive, earth moving equipments, gear couplings, electric motors, mining equipments and general industrial machinery. Servogem EP 2 (C) grease is a lime base grease developed to meet the IPSS 1-09-009-1997 requirements. The product is suitable for lubrication of severely loaded bearings at a temperature of (-) 20 to +650C where ingress of water cannot be avoided. Servogem EP 0(N) has better water washout resistance and higher antiwear properties. Servogem EP 2(S) has superior thermal and oxidation stability and resistance to water washout. Servogem EP 2X is a calcium complex grease conforming to IS:7623 Grade 2 1993 except thickener type.



## INDUSTRIAL GREASES

PRODUCT	Colour	Worked Penetration at 25 deg C after 60 strokes	Drop Point deg C Min.	Description / Application
<b>High Temperature Greases</b> Servogem HT Servogem HT 3 Servogem HTXX	Brown Brown Black	280 – 300 220 – 250 280 – 305	280 280 300	Servogem HT and HTXX are non-soap base smooth structure greases having excellent ability to withstand high temperature and severe shock load conditions. Servogem HTXX has high load bearing ability. These greases meet U.S. Steel 372 requirement, IPSS:1-09-008-1997 and IS:12790-1999 Reaffirmed 2004, specification and are recommended for the lubrication of machine elements, plain bearings and anti-friction bearings operating at high temperatures.
<b>Complex Greases</b> Servorex L0 Servorex L1 Servorex L2	Black Black Black	370 – 400 340 – 385 310 – 340	204 204 204	Servorex greases are calcium-complex base greases for anti-friction and plain bearings operating at medium speed under heavy and/or severe shock loads. Due to their excellent water repellent characteristics these greases are successfully used for bearing lubrication of steel mills, cane crushers and mill rolls of sugar factories. Servorex greases are used by various steel plants in centralised grease lubrication systems and are also recommended for grease lubricated gear couplings.
Servoplex LC 1 Servoplex LC 2 Servoplex LC 3	Brown Brown Brown	290 – 315 280 – 305 220 – 250	260 260 260	Servoplex LC are lithium complex greases having high water tolerance and mechanical stability combined with excellent high temperature performance. Servoplex LC are ideally suited for application by centralised grease systems due to good resistance to oil separation under pressure and mechanical stability. Servoplex LC greases are widely in use in Steel Plants, Mining and Engineering Industries.

## INDUSTRIAL GREASES

PRODUCT	Colour	Worked Penetration at 25 deg C after 60 strokes	Drop Point deg C Min.	Description / Application
Servoplex GC 1-1000	Black	310 – 340	180	Servoplex GC 1-1000 is a lithium complex, NLGI 1 grease formulated with a highly viscous base oil and is specially designed for lubrication of couplings of various designs. It provides effective lubrication and protection against wear in heavily loaded gear couplings and resists separation of the oil from the soap thickener at high rotating speeds.
<b>High Temperature Greases</b> Servogem Super HT (0) Servogem Super HT (1) Servogem Super HT Servogem Super HT (T) Servogem Super HT (B) Servogem Super HTXX	Brown Brown Brown Brown Brown Black	355 – 385 310 - 340 265 – 295 275 – 295 265 – 280 265 - 295	280 303+ 303+ 280 300 300	Servogem Super HT and Super HTXX are premium quality modified calcium sulphonate complex greases suitable for lubrication over a wide temperature range of (-)100C to + 1800C and has excellent pumpability characteristics making it specially suitable for centralised lubrication systems of large industrial units. Servogem Super HT Greases are recommended for wide range of industrial applications where high temperatures are encountered. Servogem Super HTXX is incorporated with solid lubricants for superior performance under conditions of high load, high temperature & ingress of water. These greases are ideal choice for Steel Plant applications such as continuous casters, couplings, oscillators, run out rolls, blowers, furnace doors etc. They are also suitable for Mining Industries for applications such as rock crushers, conveyor, drilling machinery etc.
Servogem Super JB 2	Black	290 – 315	280	Servogem Super JB2 grease is designed for lubrication of journal bearings in Sugar Mills.
<b>Fire Resistant Grease</b> Servogem Fyrex	Brown	310 – 340	180	Servogem Fyrex is a fire resistant grease developed for lubrication in roller bearings of conveyor where there is a possibility of hot or molten metal coming into contact with the bearings. Such applications are mostly in Steel plants.

## INDUSTRIAL GREASES

PRODUCT	Colour	Worked Penetration at 25 deg C after 60 strokes	Drop Point deg C Min.	Description / Application
Servogem Sintr EP 2	Dark Brown	280 – 305	180	Servogem Sintr EP2 is a lithium EP grease developed for use in Sinter plant application in Steel mills. The grease meet IPSS:1-09-005-99 specification.
Servoplex AL 00 Servoplex AL 2	Brown Light Brown	400 – 430 265 – 295	160 260	Servoplex AL greases are premium quality Aluminium-complex grease which provide excellent performance in anti-friction bearings and increased lubrication life compared to lime, sodium and lithium greases. Servoplex AL 2 is recommended for application areas such as steel plants, mining, textile etc. where conditions of high load, temperature and ingress of water exists. Servoplex AL 00 is suitable for gear lubrication. The products are available with base oils of different ISO VG grease.
Servogem TX Servogem TXX	Light Brown Black	265 – 295 265 – 295	260 260	Servogem TX & TXX are Titanium – Lithium Complex greases possessing inherent high load carrying capacity, enhanced oxidation stability, anti-rust and anti-corrosion properties. They are recommended for high temperature applications in steel plants, power plants, paper and packaging industry etc. Servogem TXX contains solid lubricant and takes care of severe lubrication requirements of high temperature, heavy load conditions. These greases are compatible with Lithium, Lithium Complex, Aluminium Complex, Clay based greases etc.
Servoplex GP-3	Off white	220 – 250	220	Servoplex GP-3 is a lithium complex grease developed against SKF MT-33 specification. The grease is meeting the noise level rating of GN3 of SKF MT33.
Servoplex PU-2	Purple	265 – 295	260	Servoplex PU-2 is a polyurea based grease for use in Steel plant applications. It has wide operating temperature range from (-) 30 deg C to 180 deg C. It possesses excellent thermal stability, water and corrosion resistance and high service life.

## INDUSTRIAL GREASES

PRODUCT	Colour	Worked Penetration at 25 deg C after 60 strokes	Drop Point deg C Min.	Description / Application
Servoplex BQ- 2	Off white	265 – 295	220	Servoplex BQ-2 is a lithium complex grease developed against SKF VT 354 specification. The grease is meeting the noise level rating of GN2 and high temperature life test as per SKF VT 354 specifications.
<b>Chain Grease</b> Servo Chain Compound  Servo Chain Compound (LGB)	Tacky Brown  Yellow Brown	70 – 90 (Unworked) 60 – 80 (Unworked)	75  80	Servo Chain Compound is recommended for lubrication of chains and is applied by dipping the chain in the molten compound so that it penetrates well in-between the narrow clearances of the pin-bush and the bush rollers. Servo Chain Compound provides resistance to formation of tight links, thereby reducing wear and elongation of chains and also protects the sprocket and transmission components against rust, corrosion and wear even in contact with high water. Servo Chain Compound (LGB) has superior antiwear properties and resistance to corrosion.
Servo Chaingrease WG	Creamy White	75 – 95	85 – 105	Servo Chaingrease WG has been specially developed for lubrication of heavy duty automobile chains. The grease has excellent oil holding capacity.
Servo Rolon Grease	Cream	355 – 385	–	Rolon Servo Grease is a specially formulated liquid chain grease for lubrication of automotive chain drives. It contains volatile solvent and should be kept away from naked flame.
<b>Graphited Greases</b> Servogrease Graphited 4080	Black	300 – 350	88	An Aluminium Stearate grease compounded with Graphite. It meets the IS:408 specification and is used for corrosion prevention of ERC (Elastic Rail Clips) of Railway tracks.

## INDUSTRIAL GREASES

PRODUCT	Colour	Worked Penetration at 25 deg C after 60 strokes	Drop Point deg C Min.	Description / Application
Servogrease Graphited 5081 Servogrease Graphited 5082 Servogrease Graphited 5083	Black Black Black	310 – 340 265 – 295 175 – 205	95 100 95	Servogrease Graphited are recommended for general lubrication under comparatively high load and low relative displacement of inter-acting surfaces. These greases meet IS:508-1987 (Reaffirmed 1993) specifications for Grade 1, Grade 2 & Grade 3 respectively. These greases are recommended for leaf springs, hydraulic rams, plungers, slides, elevator cables, pantograph pans, steel wire ropes & certain anti-seize purposes.
<b>Cement Plant Greases</b> Servogrease 300	Black	310 – 340	180	Servogrease 300 is a priming and pre-start lubricant recommended for lubrication of freshly installed large open girth gear drives of rotary kilns, cement mills, sintering plants, ball mills, tube mills etc. This grease has adhesive and extreme pressure characteristics to take care of protection from initial damages. Servogrease 300 is applied with a brush.
Servogrease CG 10 Servogrease CG 20 Servogrease CG 50 Servogrease CG 50 (0)	Black Black Black Black	380 – 420 400 – 430 400 – 430 355 – 385	180 180 180 180	Servogrease CG are sprayable adhesive lubricant, which has been developed for very severe lubrication conditions encountered in very slow speed, large open gear drives. The lubrication films adhere strongly to the gear surface and are unaffected by temperature changes. They are recommended for lubrication of open gear drives in cement plant, steel plant and mining industry such as rotary kilns, cement mills, sintering plants, ball mills etc. They pass FZG 12th stage. Servogrease CG 50(0) is of NLGI zero consistency.

## INDUSTRIAL GREASES

PRODUCT	Colour	Worked Penetration at 25 deg C after 60 strokes	Drop Point deg C Min.	Description / Application
Servogrease RN	Black	400 – 430	180	Servogrease RN is a running in lubricant recommended during commissioning of large open gear drives of rotary kilns, cement mills, sintering plants, ball mills etc. It passes FZG 12th Stage. It is sprayable also.
Servogrease Repair Compound	Black	310 – 340	180	Servogrease Repair Compound is recommended for the machining of repaired gear tooth of large open gear drives of rotary kilns, cement mills, sintering plants, ball mills etc. It is applied by a brush, wherever damaged gears are to be repaired. It is approved by M/s. F. L. Smith.

## INDUSTRIAL GREASES

PRODUCT	Colour	Worked Penetration at 25 deg C after 60 strokes	Drop Point deg C Min.	Description / Application
<b>Water Resistant Grease</b> Servogrease WR 1(B) Servogrease WR 2 Servogrease WR 2 (460) Servogrease WR 2(B) Servogrease WR 2 (VSP)	Black Black Brown Black Brown	295 – 315 275 – 295 280 – 300 275 – 295 280 – 305	190 175 175 175 175	Servogrease WR Greases are smooth structured grease based on Lithium – Calcium mixed soap specially designed to meet the lubrication requirement of areas where excessive water ingress cannot be avoided. They possesses excellent water resistance, EP, anti-rust and anti-wear properties for meeting the severe lubrication requirements in steel mill and other applications. They are suitable for centralized lubrication system. Servogrease WR2 (460) is formulated with base oil viscosity of ISO VG 460. Servogrease WR 1(B) and WR 2(B) have superior EP characteristics.
<b>Wire Rope Greases</b> Servogrease WRL 00 Servogrease WRL 2	Black Black	400 – 430 265 – 295	180 250	Servogrease WRL greases are Aluminium Complex Grease with good adhesive, extreme pressure and anti-wear characteristics. They are specially developed for lubrication of wire ropes in draglines, cranes, shovels, elevators, drilling rigs etc. They protect wire ropes from rust and corrosion and increase their life.
Servogem SI 0	Black	370 – 400	220	Servogrease SI 0 is a semi fluid grease containing solid lubricants and extreme pressure additives for lubrication of large open gear drives working under heavy load, low speed and high ambient temperature conditions in sponge iron industry, construction, mining, rotary kilns, Sugar mills etc. It can be used through dip as well as sprayable system.
<b>Cup Greases</b> Lubrex Cup Grease 2 Lubrex Cup Grease 3 Lubrex Cup Grease 4	Brown Yellow Brown Brown	260 – 300 220 – 250 175 – 205	100 95 95	Lubrex Cup Greases are smooth structured calcium soap greases possessing good water repellent characteristics. These greases are recommended widely for plain bearings operating under moderate to low temperatures and where the churning and vibrations are not excessive.

## INDUSTRIAL GREASES

PRODUCT	Colour	Worked Penetration at 25 deg C after 60 strokes	Drop Point deg C Min.	Description / Application
<b>Synthetic Greases</b> Servogrease SHC 600	Black	265 – 295	260	Servogrease SHC 600 is a semi synthetic base oil grease containing balanced additives and solid lubricant suitable for centralized lubrication system for very high temperature application in Steel, Aluminium, Cement, Mining industries.
Servoplex SHC 120 Servoplex SHC 460	Light Brown Light Brown	265 – 295 290 – 320	250 260	Servoplex SHC greases are lithium complex soap grease formulated with synthetic hydrocarbon base fluids and fortified with selected additives for superior performance under high load and varying temperature conditions. They have excellent thermal and oxidation stability, resistance to water and provide excellent protection against wear and corrosion and longer service life.
<b>Foodgrade Greases</b> Servogrease FG 2 Servogrease FG EP 2	Off – white Colourless	265 – 295 265 – 295	250 250	Servogrease FG are general purpose synthetic grease for food processing industry. These products have been developed by incorporating specialised FDA approved raw materials and additives. They are listed by National Sanitary Foundation (NSF), USA as food grade lubricants type H1 for applications where the grease may have incidental food contact.
Servosyngrease WM 2	Brown	265 – 295	250	Servosyngrease WM 2 is a synthetic grease with excellent corrosion protection and water resistant, with wide working temperature range, for lubrication of main shaft bearings of wind mills.
Servogrease ASZC	Brown	285 – 315	180	Servogrease ASZC is an anti-seize compound containing micro-size copper flakes and solid lubricants. It has superior mechanical stability, improved water spray off and excellent resistance to corrosion. It is suitable for applications on threaded connections and can be used in the temperature range of (-) 18 deg C to (+) 600 deg C



## INDUSTRIAL GREASES

PRODUCT	Colour	Worked Penetration at 25 deg C after 60 strokes	Drop Point deg C Min.	Description / Application
Servo Grease ZDP 1	Grey	290 – 310	190	Servogrease ZDP1 is a drill pipe thread compound grease developed for application on tool joints, drill collars and other rotary shouldered connections at Oil and gas exploration rigs to provide protection against seizure form excessive torque and also as leak proof seal at high temperature and pressures.
Servo Press Mould Grease	Brown	295 – 315	180	Servo Press Mould Grease is specially developed for the lubrication of press mould equipment to centralised lubrication system in tyre industry.
Servo Grease Estel 1 Servo Grease Estel 2	Brown Brown	310 – 340 265 – 295	180 180	Servo Grease Estel are semi synthetic, ester based., biodegradable grease with excellent water resistance property and are recommended for plain & rolling element bearings and couplings where soil and water contamination is expected e.g. machinery used in forest tree, farming, paper mills etc.

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## VISCOSITY CONVERSION TABLE

CST	Engler <sup>o</sup>	SUS	R.W. No.1 Sec	CST	Engler <sup>o</sup>	SUS	R.W. No.1 Sec	CST	Engler <sup>o</sup>	SUS	R.W. No.1 Sec	CST	Engler <sup>o</sup>	SUS	R.W. No.1 Sec	CST	Engler <sup>o</sup>	SUS	R.W. No.1 Sec	CST	Engler <sup>o</sup>	SUS	R.W. No.1 Sec
2.0*	1.14	33	31	15.0	2.32	77	68	28.0	3.82	132	117	41.0	5.47	191	168	54.0	7.11	250	221	67.0	8.82	310	274
2.5*	1.18	34	32	15.5	2.38	79	70	28.5	3.88	135	118	41.5	5.53	193	170	54.5	7.17	253	223	67.5	8.88	313	276
3.0*	1.22	36	33	16.0	2.43	81	71	29.0	3.95	137	120	42.0	5.59	195	172	55.0	7.24	255	225	68.0	8.95	335	278
3.5*	1.27	38	35	16.5	2.49	83	73	29.5	4.01	139	122	42.5	5.66	197	174	55.5	7.30	257	227	68.5	9.02	337	280
4.0*	1.31	39	36	17.0	2.54	85	75	30.5	4.07	141	124	43.0	5.72	200	176	56.0	7.37	260	229	69.0	9.08	319	282
4.5*	1.35	41	37	17.5	2.59	87	77	30.5	4.13	143	126	43.5	5.78	202	178	56.5	7.44	262	231	69.5	9.15	322	284
5.0*	1.40	42	38	18.0	2.64	89	78	31.0	4.20	146	128	44.0	5.85	204	180	57.0	7.50	264	233	70.0	9.21	324	286
5.5*	1.44	44	40	18.5	2.70	91	80	31.5	4.26	148	130	44.5	5.91	207	182	57.5	7.57	266	235	70.5	9.28	326	288
6.0*	1.48	46	41	19.0	2.76	93	82	32.0	4.32	150	132	45.0	5.98	209	185	58.0	7.63	269	237	71.0	9.34	329	290
6.5*	1.52	47	42	19.5	2.81	96	84	32.5	4.38	152	134	45.5	6.04	211	187	58.5	7.70	271	239	71.5	9.41	331	292
7.0*	1.56	49	44	20.0	2.87	98	86	33.0	4.45	155	136	46.6	6.11	213	189	59.0	7.76	273	241	72.0	9.48	333	294
7.5*	1.61	50	45	20.5	2.93	100	88	33.5	4.51	157	138	46.5	6.17	216	191	59.5	7.83	276	243	72.5	9.54	336	296
8.0*	1.65	52	46	21.0	2.98	102	90	34.0	4.57	159	140	47.0	6.24	218	193	60.0	7.90	278	245	73.0	9.61	338	298
8.5*	1.70	54	48	21.5	3.04	104	91	34.5	4.63	161	142	47.5	6.30	220	195	60.5	7.96	280	247	73.5	9.67	340	300
9.0*	1.75	56	49	22.0	3.10	106	93	35.0	4.70	164	144	48.0	6.37	223	197	61.0	8.03	283	249	74.0	9.74	343	302
9.5*	1.79	57	51	22.5	3.16	108	95	35.5	4.76	166	146	48.5	6.43	225	199	61.5	8.09	285	251	74.5	9.80	345	304
10.0	1.84	59	52	23.0	3.22	111	97	36.0	4.83	168	148	49.0	6.50	227	201	62.0	8.16	287	254	75.0	9.87	347	306
10.5	1.88	61	53	23.5	3.28	113	99	36.5	4.89	170	150	49.5	6.56	230	203	62.5	8.23	289	256	For higher viscosity multiply centistokes value by			
11.0	1.93	62	55	24.0	3.34	115	101	27.0	4.96	173	152	50.0	6.63	232	205	63.0	8.29	292	258				
11.5	1.97	64	57	24.5	3.40	117	103	37.5	5.02	175	154	50.5	6.70	234	207	63.5	8.36	294	260				
12.0	2.02	66	58	25.0	3.46	119	105	38.0	5.08	177	156	51.0	6.76	236	209	64.0	8.42	296	262				
12.5	2.07	68	60	25.5	3.52	121	107	38.5	5.14	179	158	51.58	6.83	239	211	64.5	8.49	299	264	0.132      4.632      4.08			
13.0	2.12	70	61	26.0	3.58	124	109	39.0	5.21	182	160	52.0	6.89	241	213	65.0	8.55	301	266				
13.5	2.17	72	63	26.5	3.64	126	111	39.5	5.27	184	162	52.5	6.94	243	215	35.5	8.62	303	268				
14.0	2.22	74	65	27.0	3.70	128	113	40.0	5.34	186	164	53.0	7.00	246	217	66.0	8.69	306	270				
14.5	2.27	75	66	27.5	3.76	130	115	40.5	5.40	188	166	53.5	7.05	248	219	66.5	8.75	308	272				

\*The first part of table marked with an asterisk should not be used for conversion of °E, R.W. No. 1 & SUS to CST.

Note 1 : The above table does not take into account variation of conversion factors of conversion factors relating centistokes to Saybolt and Redwood units with temperature, the figures given being based on the conversion at 60°C. The value for these two scales and the Engler readings have been rounded off to the number of significant figures shown.

Note 2 : Conversion of centistokes to centipoises is effected by multiplying the former by density of the oil at the same temperature as that the viscosity relates.

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VISCOSITY CONVERSION TABLE  
ISO VISCOSITY GRADES RO SUS AT 37.8°C AND 98.9°C

ISO GRADE	Viscosity Range cSt at 40°C	Approximate Viscosity Range SUS at 37.8°C	Approximate Viscosity Range SUS at 98.9°C		
			95 VI	65 VI	35 VI
2	1.98-2.42	32.8-34.4	-	-	-
3	2.88-3.52	36.0-38.2	-	-	-
5	4.14-5.06	40.4-43.5	-	-	-
7	6.12-7.48	47.2-52.0	-	-	-
10	9.00-11.00	57.6-65.4	34.6-35.7	34.2-35.3	33.8-34.9
15	13.5-16.5	75.8-89.1	37.0-38.3	36.4-37.8	36.0-37.3
22	19.8-24.2	105-126	39.7-41.4	39.1-40.6	38.5-40.0
32	28.8-35.2	149-182	42.9-45.0	42.0-43.8	41.4-42.9
46	41.4-50.6	214-262	47.1-49.9	45.4-47.8	44.2-46.2
68	61.2-74.8	317-389	53.0-56.9	50.3-53.4	48.6-51.1
100	90.0-110	469-575	61.4-66.9	56.8-61.0	54.0-57.2
150	135-165	708-869	74.0-81.9	66.6-72.7	62.1-67.2
220	198-242	1046-1283	90.3-101	79.3-87.6	72.6-79.5
320	288-352	1531-1878	112-126	95.7-106	86.3-95.3
460	414-506	2216-2717	139-158	116-130	104-115
680	612-748	3298-4046	178-202	145-162	127-142
1000	900-1000	4885-5994	227-257	181-204	156-175
1500	1350-1650	7385-9063	293-331	229-256	204-219

\*Conversion based on 95V

NLGI CLASSIFICATION FOR GREASES

NLGI No.	ASTM Penetration* at 25°C	NLGI No.	ASTM Penetration* at 25°C
000	445-475	3	220-250
00	400-430	4	175-205
0	355-385	5	130-160
1	310-340	6	85-115
2	265-295		

\*After working 60 strokes (ASTM D217)

SAE J300 Revised April 2013 - VISCOSITY GRADES FOR ENGINE OILS

Low Temperature Viscosities			High Temperature Viscosities		
SAE Viscosity Grade	Cranking Viscosity (mPa's @ °C)	Pumping Viscosity (mPa's @ °C) w/no yield stress	Low-Shear Rate Kinematic Viscosity (mm2/s) at 100°C		High-Shear Rate Kinematic Viscosity (mPa' s) at 150°C
	ASTM D5293	ASTM D4684	ASTM D445		ASTM D4683, D4741, D5481 or CEC 1-36-90
	Max	Max	Min	Max	Min
0W	6200 @ - 35	60,000 @ - 40	3.8	-	-
5W	6600 @ - 30	61,000 @ - 35	3.8	-	-
10W	7000 @ - 25	62,000 @ - 30	4.1	-	-
15W	7000 @ - 20	63,000 @ - 25	5.6	-	-
20W	9500 @ - 15	64,000 @ - 20	5.6	-	-
25W	13,000 @ - 10	65,000 @ - 15	9.3	-	-
16	-	-	6.1	< 8.2	2.3
20	-	-	6.9	< 9.3	2.6
30	-	-	9.3	< 12.5	2.9
40	-	-	12.5	< 16.3	3.5 (*)
40	-	-	12.5	< 16.3	3.7 (**)
50	-	-	16.3	< 21.9	3.7
60	-	-	21.9	< 26.1	3.7

(\*) for 0W-40,5W-40, & 10W-40 grades (\*\*) for 15W-40, 20W-40, 25W-40 & 40 SAE grades

AUTOMOTIVE GEAR LUBRICANT VISCOSITY CLASSIFICATION SAE J306

SAE Viscosity Grade	Max Temperature for Viscosity of 150,000 cP (°C) <sup>(1,2)</sup>	Kinematic Viscosity at 100° C (cSt) <sup>3</sup>	
		Min <sup>(4)</sup>	Max
70W	55 <sup>(5)</sup>	4.1	-
75W	40	4.1	-
80W	26	7	-
85W	12	11	-
80	-	7	<11.0
85	-	11	<13.5
90	-	13.5	<18.5
110	-	18.5	<24.0
140	-	24	<32.5
190	-	32.5	<41.0
250	-	41	-

Note - 1 cP = mPaos; 1 cSt = 1 mm²/s

<sup>1</sup> Using ASTM D 2983

<sup>2</sup> Additional low temperture viscosity requirements may be appropriatefor fluids intended for use in light- duty synchronized manual transmissions.

<sup>3</sup> Using ASTM D 445

<sup>4</sup> Limit must also be met after testing in CEC L-45-A-99, Method C(20 Hours).

<sup>5</sup> the precision of ASTM D 2983 has not been established for determinations made at tempratures below -40°C.

This fact should be taken into consideration in any producer -consumer relationship.

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