

SINOPEC



SINOPEC LUBRICANTS FOR PUBLIC TRANSPORT





SINOPEC

COMPANY

Introduction

Sinopec Lubricant Co., Ltd. Inaugurated on July 1st, 2014 in Beijing, is the largest high-tier lubricant manufacturer and marketer in China with a production capacity of over 1.46 million tons of packaged lubricants per year. With 5 regional sales centers across China, many more sales subsidiaries all over the world, 11 lube oil & grease blending and manufacturing branches domestic and 1 branch company in Singapore, as well as two independent R&D Centers in Beijing and Shanghai, It integrates the function of lubricant manufacturing, research, storage, transportation, sales and service.

Equipped with world-class automatic blending and packaging production line, Sinopec Lubricant Co., Ltd. provide over 700 kinds of lube oils and greases in all 20 categories including crankcase oil, industrial gear oil, hydraulic oil, greases, anti-coolant, brake fluid, metal working fluid, marine oil and additives, etc., which are widely used in the fields of aviation, space flight, automobile, machinery, metallurgy, mining, petrochemical engineering, electronics, etc. As one of China Aviation Partners,

Sinopec Lubricant Co., Ltd. is devoted to providing lubrication service for Shenzhou series manned space flight and Chang'e series lunar probe satellite, making great contributions to the development of China aviation and space flight causes.

With high-quality raw material and high-tech formulations evaluated by strict engine and bench tests, our products fully meet national standards, as well as other requirements of special specification standards of ISO, API, etc. With stable product quality, the company has completed ISO16949 and HSE management system certification. R&D institutes in Beijing, Shanghai and Chongqing all have "National Laboratory" certificates, and can undertake application research projects of both national and ministerial level, independently formulating various lubricant products to meet special market requirements under the technological support of RIPP (Research Institute of Petroleum processing). Some products have got technology certificates from world famous automobile manufacturers, such as Daimler-Chrysler, VW, Mercedes-Benz, Volvo, and MAN



SINOPEC LUBRICANT CO., LTD. Is Committed To Service Public Transport

and became the first lubricant option of some large-scale group Corporations including FAW-VW, Dongfeng Motor Corp., Shanghai GM, Shanghai VW, Chery, Baosteel Group Corp., etc. Besides, Sinopec has established its Automobile Industry Technology Center with Sinopec Lubricant Co., Ltd. as the core to serve as the platform for cooperation with the automobile industry.

In the process of development, Sinopec Lubricant Co., Ltd. has gradually nurtured its unique brand culture and strategy on international development. Insisting in building a high-tech, high-quality, international brand image, Sinopec lubricants have entered into more than 50 countries and regions such as Australia, New Zealand, Malaysia, etc. Service network of marine oil have been set up in Singapore, The Emirates, South Africa and ready to expand to Europe and America. July 2013, Singapore Lubricants & Grease production base was Officially put into operation. In 2013, the brand value of "Great wall Lubricant" boosted 23.28 billion RMB, ranked 52nd in China's most valuable brand list in 2013 and 1st in Chinese lubricant Industry.

Devoted to development of Chinese lubricant causes, Sinopec Lubricant Co., Ltd. has actively participated in international competition and made efforts in seeking long-term cooperation relationship with relative industries to achieve mutual development.

By virtue of years of experience in the public transportation industry, Sinopec Lubricant Co., Ltd. has developed well-established product lines in line with characteristics of the public transportation industry, including top grade diesel engine oil, driveline lubricating oil, grease, coolant and brake fluid, and received relevant certifications, thus can fully meet the demands of various public transport vehicles for lubricating oil. With a professional technical service team for the public transportation industry, the Company can provide public transportation enterprises with good-quality and efficient services. So far, it has established long-term stable cooperative relations with numerous public transportation enterprises. Adhering to the Customer demand-focused operation principle, Sinopec Lubricant Co., Ltd. will make common development and progress together with public transportation enterprises.

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Performance of Lubricants for public transport

Characteristics of public transport vehicles

Characteristics and development tendency

- The implementation of Euro IV and V driving the update of diesel public transport vehicles.
- The capacity and power of public transport vehicles have been on the increase.
- Public transport vehicles are classified diversified energies (such as diesel vehicles, gas vehicles, electric vehicles, hybrid vehicles).
- The proportion of clean public transport vehicles will further increase, with a bigger development space for CNG, LPG, LNG passenger vehicles, electric vehicle and hybrid vehicles.

Characteristics of operating conditions

- Large-size public transport vehicles require high engine work load.
- Because urban operating conditions feature a larger number of public transport stations and intersections and frequent congestions during peak traffic hours, public transport vehicles have to frequently switch between operating conditions of acceleration, deceleration and idling, with a relatively low running speed.



Performance of Lubricants for public transport vehicles

A4 Requirements of modern public transport vehicles for engine oils

I Environmental protection regulations promote the updating of public transport vehicles, and require the upgrading of engine oils.

Due to high temperature, high nitrogen and the difficulty in lubrication, gas powered public transport vehicles requiring the engine oil shall have a proper ash content to balance wear and deposition properties, and should use gas engine oils.

II Characteristics of public transport vehicles and their requirements for properties of engine lubricating oil.

⇒ Under operating conditions of low speed and high torque for a long period of time, engines may become overheated.

This requires that the lubricating oil shall have a good high temperature antioxidant property, anti-wear property and oily sludge resistance property.

⇒ The incomplete combustion will increase the amounts of soot and acidic materials.

This requires that the lubricating oil shall have a very good soot dispersancy and TBN maintenance capacity.

⇒ Public transportation companies are easy to maintain and manage them, with reduced maintenance and management costs.

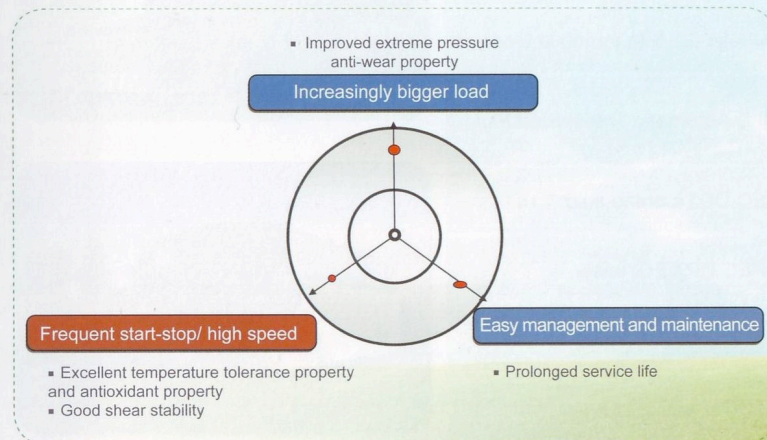
This requires that the Lubricants have a longer service life.

B₃ Requirements of modern public transport vehicles for driveline oils

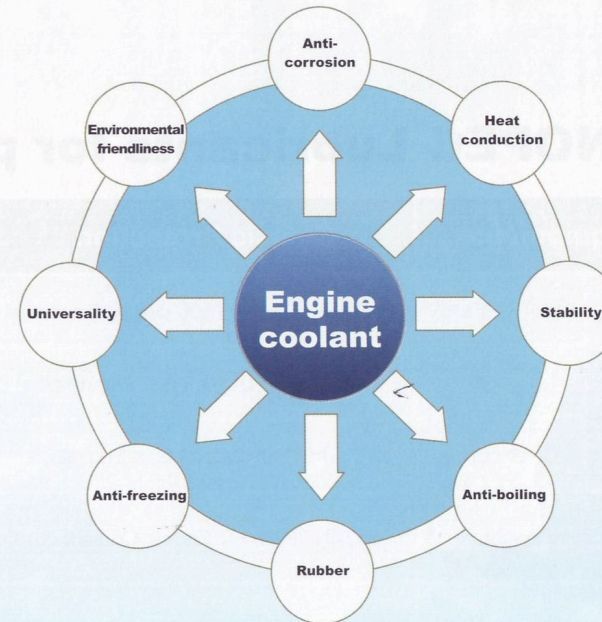
Compared with API GL-4 gear oil suitable for rear axle, MTF have an improved synchronizer property, material adaptability, rubber compatibility, pitting corrosion resistance property and gear shift quality, as well as an excellent antioxidant property, shearing resistance property and anti-shake resistance property according to the operating conditions of public transport vehicles.



C₃ Requirements of modern public transport vehicles for greases



D_D Requirements of modern public transport vehicles for cooling liquid



Because of the above properties.

The engine coolant can not be replaced by water.



SINOPEC Lubricants for public transport vehicles


Equipments		Classic Protection	Premium Protection
Engine	EuroIV、EuroV	SINOPEC TULUX T500 classic Engine oil	SINOPEC TULUX T600 Engine oil
	EuroIII	SINOPEC TULUX T400 Engine oil	SINOPEC TULUX T500 classic Engine oil
	CNG、LNG	SINOPEC CNG/LNG Gas Engine oil	SINOPEC CNG/LNG Longlife Gas Engine oil
Cooling system		SINOPEC FD Engine Coolant	SINOPEC HDC Engine Coolant / SINOPEC YF Engine Coolant
Manual transmission		SINOPEC GL-4 Automobile Gear oil	SINOPEC MTF C-I Manual Transmission / SINOPEC MTF C-II Manual Transmission
Drive axle		SINOPEC GL-5 Automobile Gear oil	SINOPEC fully synthetic GL-5 Automobile Gear oil
Automatic transmission		SINOPEC ATF-IIIH Automatic Transmission Fluid	SINOPEC ATF-IIILD Automatic Transission Fluid
Brake system		SINOPEC DOT3 brake fluid	SINOPEC DOT4 brake fluid
Wheel hub bearing		SINOPEC HP-R Grease	SINOPEC HPXT Grease
Universal joint		SINOPEC Multipurpose Lithium Grease	SINOPEC JMA T ₂ Grease
Urea storage tank		SINOPEC Aqueous Urea Solution for SCR	





Introduction of SINOPEC Lubricants for public transport vehicles

- ◎ SINOPEC Engine Oils
- ◎ SINOPEC Driveline Oils
- ◎ SINOPEC Greases
- ◎ SINOPEC Coolant
- ◎ SINOPEC Aqueous Urea Solution for SCR
- ◎ SINOPEC Glass Cleaner



Engine Oils



SINOPEC TULUX T600
Diesel Engine Oil

■ Specifications

- ◆ ACEA E7-08, E9-08
- ◆ Diesel: CJ-4, CI-4 plus, CI-4 and earlier HDDEO specifications
- ◆ Petrol/Gasoline: SM, SL and earlier specifications
- ◆ Cummins CES20081 ◆ VOLVO VDS-4/VDS-3/VDS-2
- ◆ MAN 3275 ◆ MTU Type 2.1 ◆ MB 228.31
- ◆ Detroit DDC93k218/DDC93k215/DDC93k214
- ◆ Caterpillar ECF-3/ECF-2/ECF-1-a
- ◆ Renault RVI RLD-3
- ◆ MACK EO-O Premium Plus/EO-N/EO-MPlus

■ Performances

- Advanced low-ash additive system provides excellent protection for modern low-emission diesel engines equipped with EGR, DPF or other technologies.
- High shear stability ensures that viscosity is maintained, even under severe, high-temperature service conditions, providing greater engine wear protection and extended engine life.
- Excellent soot and deposit control provide protection against piston deposits and valve train wear, and ensure engine cleanliness and smooth running.
- Excellent thermal and oxidation stability protect the engine against rust, corrosion and wear caused by the formation of sludge and deposits.

■ Applications

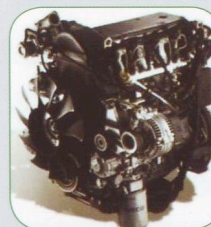
- Heavy duty diesel engines with EGR, DPF or other new technology low-emission systems, which require a low-ash lubricant in order to meet Euro III/IV/V and Australian ADR 80/00, 80/02 and 80/03 requirements.
- Heavy duty diesel engines using exhaust after-treatment systems.
- Heavy duty diesel engines operating continuously under very heavy or high load-factor conditions.
- On-highway application in heavy-duty vehicles operating under severe conditions, such as long-distance or urban traffic vehicles; also suitable in light-duty on-highway applications.
- Petrol/gasoline engines requiring an API SM quality oil.
- Suitable for mixed fleet use.



■ Application in Public Transport Vehicles in Beijing

Sever traffic Congestion 5 vehicle, 600,000 km total No oil refilling for nearly 50,000 km.

During the whole course of the test, SINOPEC TULUX T600 shows a stable viscosity; The engines showed normal oil pressure, slight engine wear, small amount of sediments such as oily sludge and stable power performance. The user spoke highly of the product, and has widely applied it.



Test engine
Iveco F4AE0682H



Test vehicle



Main bearing bush of the test vehicle
after running for nearly 50,000km



SINOPEC TULUX T500
Classic Diesel Engine Oil

Specifications

- ◆ ACEA E7-08
- ◆ Diesel: CI-4, CH-4 and earlier HDDEO specifications
- ◆ Petrol/Gasoline: SL
- ◆ Caterpillar ECH-1-a
- ◆ Cummins CES20078/20077/20076
- ◆ Mark EO-M plus
- ◆ VOLVO VDS-3/VDS-2
- ◆ GB 11121-2006(SL)
- ◆ GB 11122-2006(CI-4)
- ◆ JASO DH-1
- ◆ Renault RLD-2
- ◆ DDC 93K215
- ◆ MAN 3275
- ◆ MTU Type 2
- ◆ MB 228.3

Performances

- Outstanding soot and deposit control provide protection against piston deposits and valve train wear, and ensure engine cleanliness and smooth running.
- High-quality base stocks and an advanced additive system work to reduce the build up of sludge and reduce oil thickening, thereby keeping the product in grade for longer and extending oil life.
- High acid neutralisation ability, together with TBN retention, provides rust and corrosion protection and prolongs engine life.
- Excellent thermal and oxidation stability protect the engine against rust, corrosion and wear caused by the formation of sludge and deposits.

Applications

- Heavy-duty vehicles operating under severe conditions.
- Running continuously under heavy or high load-factor conditions.
- Mixed fleet use.





■ Application in the Public Transportation Industry

● Beijing Public Transport—During its service for eight years, the engines have shown a stable power output, steady oil pressure, low mechanical wear and good cleanliness, without any oil pressure or starting problem caused by the engine lubricating oil.

● Hangzhou Public Transport—During the running monitoring, the engine lubricating oil has shown excellent properties, and the engines have shown a stable power output, steady oil pressure, low mechanical wear and good cleanliness. During the long-term operation process, the equipment has shown normal operation, without any oil pressure or starting problem.

● Dongguan Public Transport—During the tracking test and the comprehensive lubricating oil and vehicle evaluation, the lubricating oil has shown excellent properties, and can meet the vehicle operation requirements of the company. During the two years of operation, the equipment has shown normal operation, and the engines have shown a stable power output and steady oil pressure.

● Nanning Public Transport—During the tracking test and the comprehensive lubricating oil and vehicle evaluation, the lubricating oil has shown excellent properties, and can fully meet the vehicle operation requirements of the company. Compared with similar products of an internationally renowned brand, the lubricating oil has shown excellent properties and got approval from the customer.



SINOPEC TULUX T400
Engine Oil

■ Specifications

- ◆ ACEA E7-08
- ◆ Diesel: CH-4, CG-4, CF-4 and earlier
- ◆ Petrol/Gasoline: SJ
- ◆ Caterpillar ECF-1-a (15W-40)
- ◆ Cummins CES 20078/20077/20076
- ◆ DDC 93K215
- ◆ Mark EO-M Plus

- ◆ MAN 3275
- ◆ MB 228.3
- ◆ MTU Type 2
- ◆ VOLVO VDS-3/VDS-2
- ◆ Renault RLD-2

■ Performances

- Excellent detergent and dispersant properties provide soot and deposit control, protect against piston deposits and valve train wear, and ensure engine cleanliness and smooth running.
- Good shear stability properties ensure that viscosity is maintained, even under severe, high-temperature service conditions, providing improved engine wear protection and extended engine life.
- Outstanding antiwear properties protect against cylinder liner and bearing wear extending engine life.
- Excellent oxidation stability reduces oil thickening during use and prolongs oil drain intervals.



■ Applications

- High-speed, four-stroke cycle diesel engines, requiring an API CH-4 quality oil to meet Euro III (ADR 79/01) emissions standards.
- Heavy duty, turbocharged diesel engines of container trailers operating at high pressures.

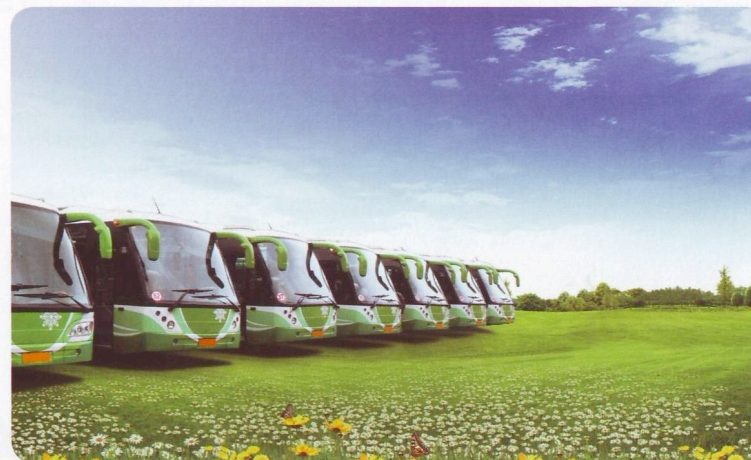
■ Application in the Public Transportation Industry

- High-speed, four-stroke cycle diesel engines, requiring an API CH-4 quality oil to meet Euro III (ADR 79/01) emissions standards.
- Heavy duty, turbocharged diesel engines of container trailers operating at high pressures.
- Maoming Public Transport—During the tracking test, the lubricating oil has shown excellent properties, and can fully meet the vehicle operation requirements of the company. Compared with similar products of an internationally renowned brand, the lubricating oil got approval from the customer, and the customer selected it. Over the four years of operation, the lubricating oil has shown excellent properties and ensures stable equipment state.
- Fuzhou Public Transport—Over the seven years of operation, Zunlong products have shown excellent properties and won praise from the customer. Compared with similar products of an internationally renowned brand, the lubricating oil won praise from the customer.

➤ **Qingdao Public Transport**—Over the four years of operation, the lubricating oil has shown excellent properties. Compared with similar products of an internationally renowned brand, the lubricating oil has shown excellent properties and won praise from the customer.

➤ **Hangzhou Public Transport**—According to the results of the running test, Great Wall products have shown stable properties, and can meet the requirements of the company for lubricating various domestic and foreign high-power engines and provide engines with good lubrication and protection.

➤ **Zhuzhou Public Transport**—On its public transport vehicles, Zunlong T400 diesel lubricating oil product solved such problems as engine lubricating oil densification and high engine failure rate for the customer. Compared with similar products of an internationally renowned brand, the lubricating oil has won praise from the customer. Over the three years of operation, the product has shown excellent properties either on the customer's diesel engines or on its diesel-electric-fueled hybrid vehicles.



SINOPEC CNG/LNG Gas Engine Oil

Specification

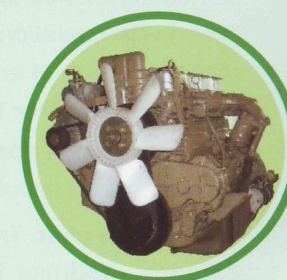
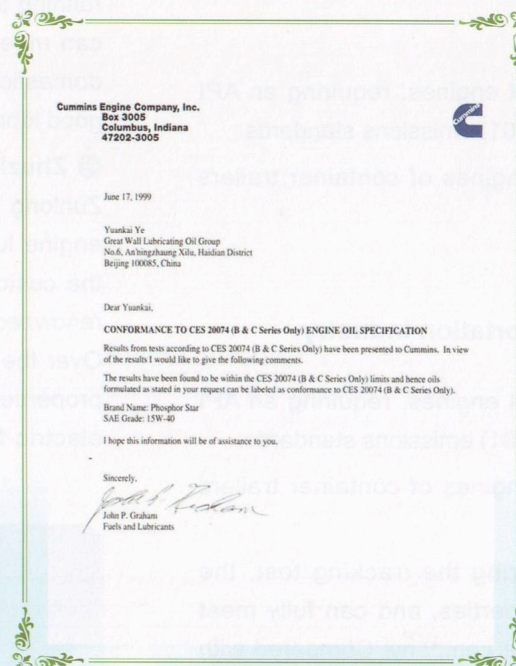
◆ CES 20074 (15W-40)

Performances

➡ Special formulation for CNG/LNG and other gas engines, effectively protecting valve seat/guide and other engine parts.

➡ Outstanding high/low temperature properties and super cleaning performance providing required protection against wear of critical engine parts under high and low speed crossing state, reducing deposit and sludge buildup, and keeping engine clean.

➡ Professional low ash formulation designed to provide more effective protection of CNG/LNG and other gas engines.





Applications

- CNG/LNG and other vehicle gas engines.
- Gas engines such as those manufactured by Caterpillar, Cummins and Mercedes-benz.

Application in Wuxi Public Transport

Along the bus line No.23 in Wuxi, three Ankai HF 610 GK 63 public transport vehicles (engine: CA 6102 N2) of Wuxi Liulong Public Transport Co.,Ltd. was filled with Great Wall engine lubricating oil (15W-40) for a 17,500km-25,000km-long engine lubricating oil switchover test (without refilling the lubricating oil).





SINOPEC CNG/LNG Longlife Gas Engine Oil

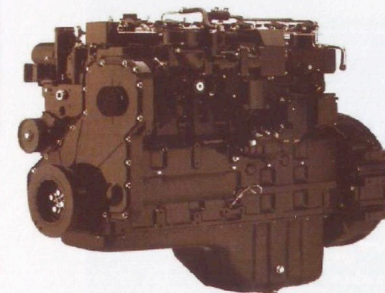
Introduction of SINOPEC CNG/LNG Long Service Life Gas Engine Lubricating Oil Product

- ◆ Better extreme pressure anti-wear property
- ◆ Better oxidation stability
- ◆ Oil change interval as long as 30,000km

For Cummins CES 20074

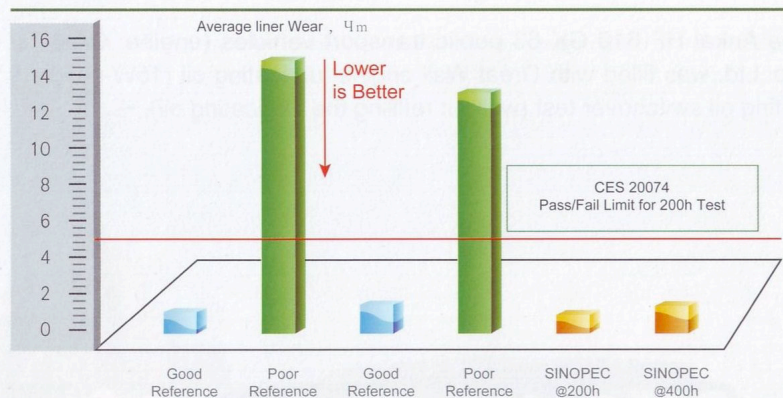
C8.3G

Test Duration	200 h
Engine Speed	2400 RPM
Power Output	200 kW
Fuel Feed Rate	43 kg/h
Gallery Oil Temp	106°C
Coolant Temp	90°C
Intake Air Temp	46°C
Fuel Temp	20°C



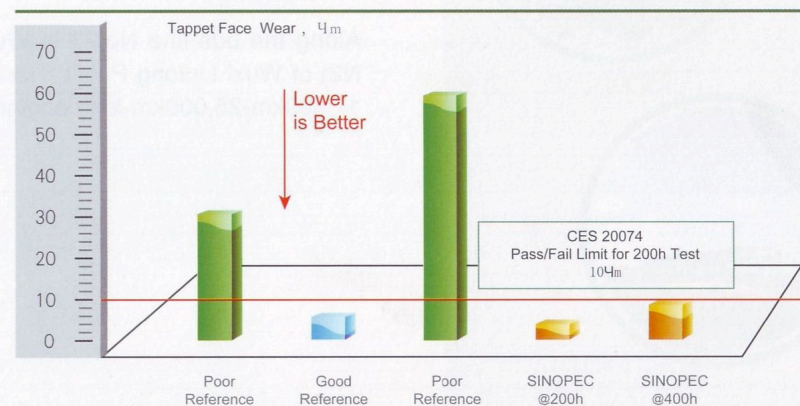
Cummins C8.3G liner wear

Cummins - C8.3G Liner wear



Cummins C8.3G tappet height loss

Cummins - C8.3G Tappet height loss



According to the bench test, Great Wall CNG/LNG long service life gas engine lubricating oil showed an extremely excellent anti-wear property.

SINOPEC Driveline Oils

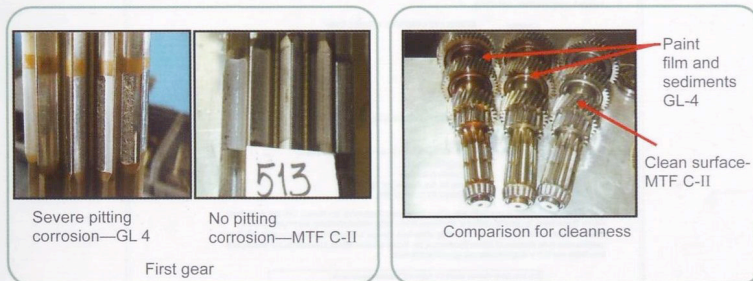
Sinopec MTF C-II Manual Transmission Fluid

Specifications

- ◆ API GL-4
- ◆ MAN 341TL
- ◆ Eaton S-series
- ◆ VOLVO 97305
- ◆ ZF TE-ML-02D

Comparison of performance of MTF and GL-4 after running test

MTF and GL-4 lubricating oil products were respectively applied in six vehicles (MTF product for three vehicles, and GL-4 product for other three) for a 300,000km-long running test (oil refilling for every 40,000km). Upon completion of the test, their transmissions were disassembled for the observation of wear.



Performances

- Excellent fuel economy, effectively prolonging oil drainage, reducing operation costs.
- Excellent property of changing gear with synchronizer, increasing easiness of driving.

- Good carrying capacity, preventing gears from scratching and wear, prolonging service life of transmission, effectively protecting key parts.
- Excellent shear stability.
- Excellent thermal and oxidation stability, reducing formation of oxide.

Applications

- Manual transmission for commercial vehicles with synchronizer.
- Commercial vehicles with manual transmission of various brands.

Application in world Expo, etc.



MTF C-II 75W/90 has shown excellent properties on new energy public transport vehicles and passed the running test, with a service life that is five to six times of conventional lubricating oil products. It has been adopted for public transport vehicles of World Expo and provided service at World Expo. In the meantime, it has applied in transmissions of pure electric vehicles and hybrid vehicles of Dezhou Public Transport and Beijing Public Transport.



MTF C-II 75W/90 and MTF C-II 80W/90 products have shown excellent properties on heavy trucks and passed the running test, with a prolonged service life. They have even shown good properties after a 150,000km-long test.



SINOPEC ATF IIIH Automatic Transmission Fluid

Specifications

- ◆ GM Dexron IIIH
- ◆ Ford Mercon
- ◆ Allison C-4


Performances

- Excellent anti-friction performance ensures smooth and consistent operation.
- Outstanding low temperature fluidity.
- Outstanding wear protection prolongs components life.
- Reduces leaks by keeping seals soft and pliable.
- Suitable for automatic transmission and power steering system.



Typical Properties

Viscosity , cSt @ 100 °C	7.089
Viscosity , cSt @ 40 °C	31.99
Viscosity , index	194
Flash Point (COC) , °C	200
Brookfield , cP @ -40°C	4500


 Indianapolis, IN 46206-0894

MADAM CHEN, HUIQING
 NO. 4 WEST ROAD OF ANNING ZHANG
 HAIKUAN DISTRICT, BEIJING
 BEIJING
 CHINA

Dear MADAM CHEN, HUIQING:

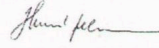
The purpose of this letter is to document that the fluid listed below has been approved as a service lubricant for Off-Highway Allison Heavy-Duty Automatic Transmissions:
 Sample J.269 (02/04/2008 1:25:17PM)

Company:	LUBRICANT COMPANY, SINOPEC CORP.		
Brand Name:	SINOPEC ATF-IIIH		
Additive Code:	05110427	Fluid Code:	NONE
Viscosity:	ATF	Fluid Type:	C4 ONLY
Approval #:	C4-31602008	Approval Type:	Original
Approval List:	Fluid will be published in ATP Approved C4 Service Fluids List.		

Please review the information to ensure correctness. Should there be any changes, please contact:
 Rene Herr - C4 Coordinator
 Southwest Research Institute
 6220 Calles Rd., San Antonio, TX 78228-0510
 (210) 532-5995 FAX (210) 532-4858

This fluid has been qualified in accordance with Allison Transmission Engineering Specification TES-226. Accordingly, Allison Transmission, Inc. must be notified of any changes in base oil(s), method of refining, and/or composition or concentration of the additive system used in blending of this fluid. Changes in formulation may require either partial or complete retest at the discretion of Allison Transmission, Inc. Failure to inform Allison Transmission, Inc. of changes in formulation may lead to disqualification and approval nullification.

It is mandatory that the above C4 Approval Number appear on all marked product containers or container labels.

Sincerely,

 Thomas L. Johnson - Administrative Engineer



■ Specifications

Voith H55.6335.3x

◆ ZF TE-ML 14B

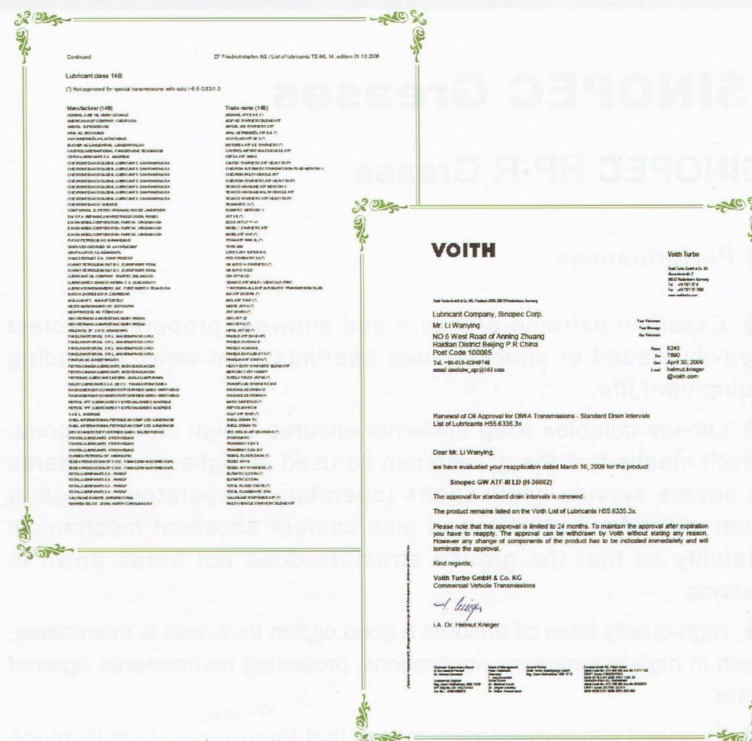
■ Performances

- Outstanding oxidation stability, thermal stability and detergency ensure long fluid life, prevent the build up of deposits, and allow for extended drain intervals.
- Excellent frictional characteristics improve transmission efficiency and shifting performance, and ensure consistent, reliable, trouble-free operation of transmission systems.
- Excellent antiwear performance and good oil film strength protect components from wear and ensure long transmission life.
- Very good low-temperature properties protect against wear under cold start-up and running conditions.
- Automatic transmission systems of commercial vehicles, including bus rapid transit (BRT) fleets, school bus fleets, emergency vehicles, recreation vehicles and commercial utility vehicles, where extended drain intervals are required.



■ Typical Properties

Density at 20°C , kg/m ²	853.8
Viscosity , cSt @ 100°C	7.630
Viscosity , cSt @ 40°C	37.37
Flash Point (COC) , °C	210
Brookfield,cP @ -30°C	3200
Brookfield,cP @ -40°C	12500





SINOPEC Greases

SINOPEC HP-R Grease

■ Performances

- Excellent extreme pressure and antiwear properties protect heavily loaded or shock-loaded bearings from wear, extending equipment life.
- Lithium complex soap thickener ensures a high dropping point, which means that the grease can be used at higher temperatures in severe service applications (operating temperature range is from -30°C to $+180^{\circ}\text{C}$), and also confers excellent mechanical stability so that the grease structure does not break down in service.
- High-quality base oil ensures a good oil film thickness is maintained, even in high-temperature applications, protecting components against wear.
- Excellent water resistance means that the grease stays in place

and is not washed or sprayed off in wet conditions, reducing the need for frequent re-application.

- Excellent protection against rusting and corrosion ensures long component life, and extends maintenance intervals.
- Good thermal and oxidation stability ensure longer grease life under high-temperature conditions, providing optimum lubrication, extending equipment life and reducing maintenance requirements.

■ Applications

- Automotive wheel bearings, particularly those operating under the high-temperature, high-load conditions that are caused by braking at high speed.
- General lubrication of chassis points (e.g. shackles, tie rod ends, steering knuckles, control arms and king pins), electric motors and water pumps of buses.



SINOPEC HPXT Grease

■ Performances

- ➡ Lithium complex soap thickener ensures a high dropping point, which means that the grease can be used at higher temperatures in severe service applications (operating temperature range is from -30°C to $+180^{\circ}\text{C}$), and also confers excellent mechanical stability so that the grease structure does not break down in service.
- ➡ Excellent adhesive properties ensure the grease sticks to metal surfaces even under high-temperature conditions, and provides an optimum oil film thickness to protect the moving parts and provide long service life.
- ➡ Excellent extreme pressure and antiwear properties protect heavily loaded or shock-loaded bearings from wear, extending equipment life.
- ➡ Excellent water resistance means that the grease stays in place and is not washed or sprayed off in wet conditions, reducing the need for frequent re-application.
- ➡ Excellent protection against rusting and corrosion ensures long component life, and extends maintenance intervals.
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■ Applications

- ➡ Automotive wheel bearings, particularly those operating under the high-temperature, high-load conditions that are caused by braking at high speed.
- ➡ General lubrication of chassis points (e.g. shackles, tie rod ends, steering knuckles, control arms and king pins), electric motors and water pumps, buses.
- ➡ Applications requiring an NLGI GC-LB wheel bearing and chassis grease where the operating temperature range is between -30°C and $+180^{\circ}\text{C}$.

Main maintenance parts of public transport vehicles

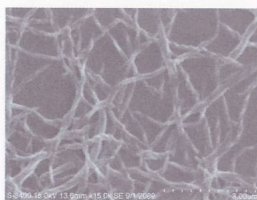
Disassembled bearing using HPXT



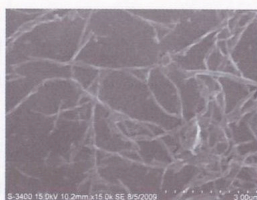
Disassembled bearing using foreign lubricating grease A



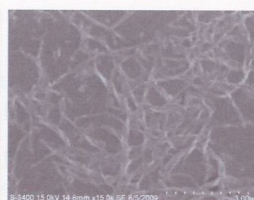
Soap fiber structure



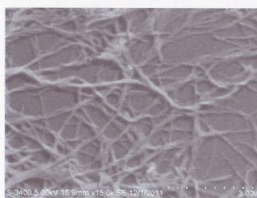
(a) Fiber structure before the test for HPXT lubricating grease



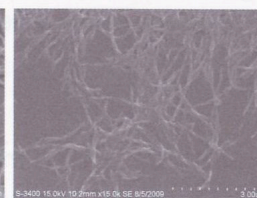
(b) Soap fiber structure at the end of the bearing after the test



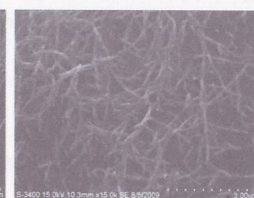
(c) Fiber structure of the bearing retainer after the test



(d) Fiber structure before the test for foreign lubricating grease A



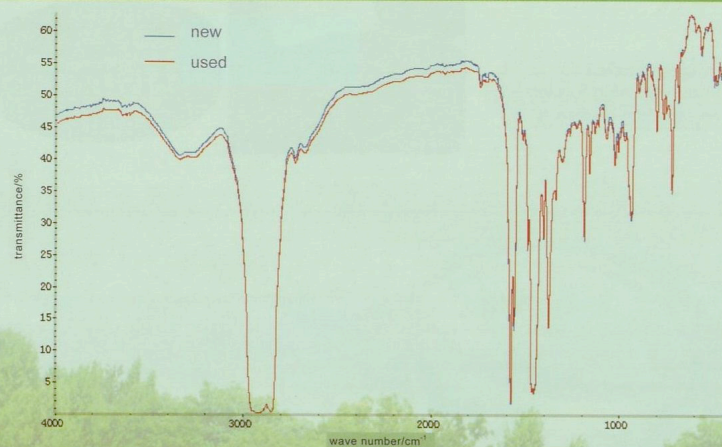
(e) Soap fiber structure at the end of the bearing after the test



(f) Fiber structure of the bearing retainer after the test

Degree of oxidation

Comparison of infrared spectra before and after using HPXT lubricating grease



Comparison of infrared spectra before and after using foreign lubricating grease A



Conclusion for the running test for SINOPEC HPXT lubricating grease

1. After a 50,000km-long running test, test vehicles using SINOPEC HPXT lubricating grease did not show any oil or grease leakage outside of their wheel hubs or any corrosion, rusting or discoloration in their bearings, with a good protective property.
2. After the running test, HPXT lubricating grease showed no significant change in the dropping point, varying degrees of softened consistence and slightly damaged soap fiber. According to an infrared detection, the tested lubricating grease showed no significant oxidative deterioration.



SINOPEC Coolant

SINOPEC YF Engine Coolant

Engine Coolant YF

■ Specifications

- | | |
|-----------------------|----------------|
| ◆ ASTM D 3306, D 4985 | ◆ BS 6580:2010 |
| ◆ JIS K 2234 | ◆ SAE J1034 |

■ performances

- The advanced anticorrosion system provides excellent protection against crevice corrosion in aluminium and cavitation corrosion-erosion in cast iron, protecting the radiator components and ensuring longer life.
- The non-silicate formulation protects against the formation of gels and deposits, even in the presence of hard water, ensuring improved coolant stability and longer effective coolant life.
- Excellent heat transfer properties enable high-temperature engine parts (especially the aluminium heat-transfer surfaces found in some modern engines) to be effectively cooled and protected from damage.
- Can offer a single coolant/antifreeze for use in a wide range of vehicles, so ideal for mixed fleet use.
- Fully compatible with rubber tubing and sealing materials, and so prolongs the service life of water pump and seals.
- Good stability enables the product to be stored year round without problems.
- This environmentally friendly product contains no harmful, toxic or carcinogenic chemicals, and is not damaging to water or soil ecosystems.

■ Applications

- Radiator systems of, diesel, LPG and CNG-fuelled engines in buses.
- Radiator systems of modern aluminium alloy engines.
- Radiator systems of diesel engines fitted with cast iron cylinder liners.

SINOPEC HDC Engine Coolant

■ Performances

- The formulated strong oxidation corrosion inhibitor can fully meet the requirements of ASTM D6210 for nitrite and molybdate content.
- Can be directly applied in heavy-duty diesel engine, with no need of additional reinforcing agent.
- Good hard water resistance property, antibacterial property and storage stability.
- Excellent high temperature aluminum alloy corrosion inhibition property.
- Recommended operating mileage: 100,000km.

■ Applications

- Applicable for engine cooling systems of various public transport vehicles.
- Can be applied in various diesel engines such as those made by Caterpillar and Commins.

SINOPEC Aqueous Urea Solution for SCR

performances

- As a good-quality NO_x reducing agent, it shows an excellent protective property for the SCR system.
- Through the selective catalytic reduction reaction, it can effectively reduce the emission of nitrogen oxide.
- It can be adopted for the SCR tail gas treatment system to effectively reduce te fuel consumption.
- Safe, non-toxic, easy to use and transport.

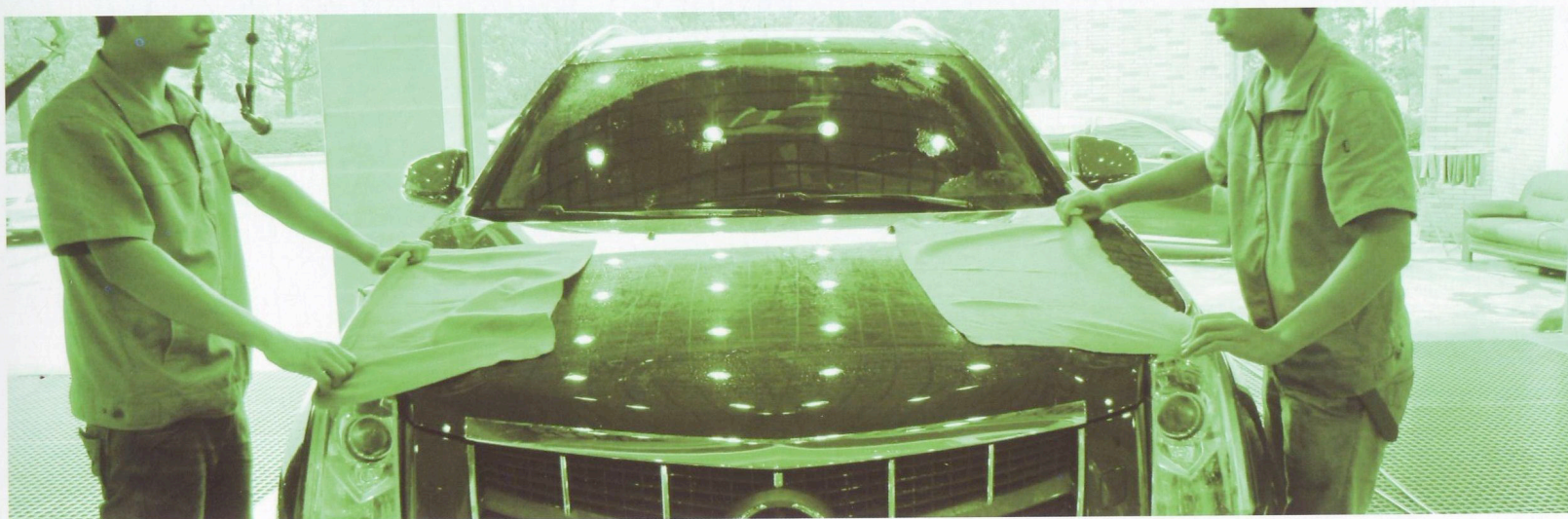
API Certification



Application in Xiamen King Long

调整供货比例单										第1页 共1页	
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	正文:	根据KCL21003尿素联合招标结果, 尿素供应切换为中国石化上海分公司南特工贸分公司, 自其在厦门的代理商厦门市南特工贸有限公司负责供货, 尿素物料代码仍为原代码10023238, 请物流部注意前化库存。					生管部				
	发文	日期	10-8-18								
批准	日期	10-8-23									
技术部	技术	日期	10-8-23		售后反馈	签字	日期	10-11-30			
物流部	物流	日期	10-8-25			意见:					
品管部	品检	日期	10-9-3			签字	日期				
品管部	结论	超段时间与项目				品质确认	签字	日期			
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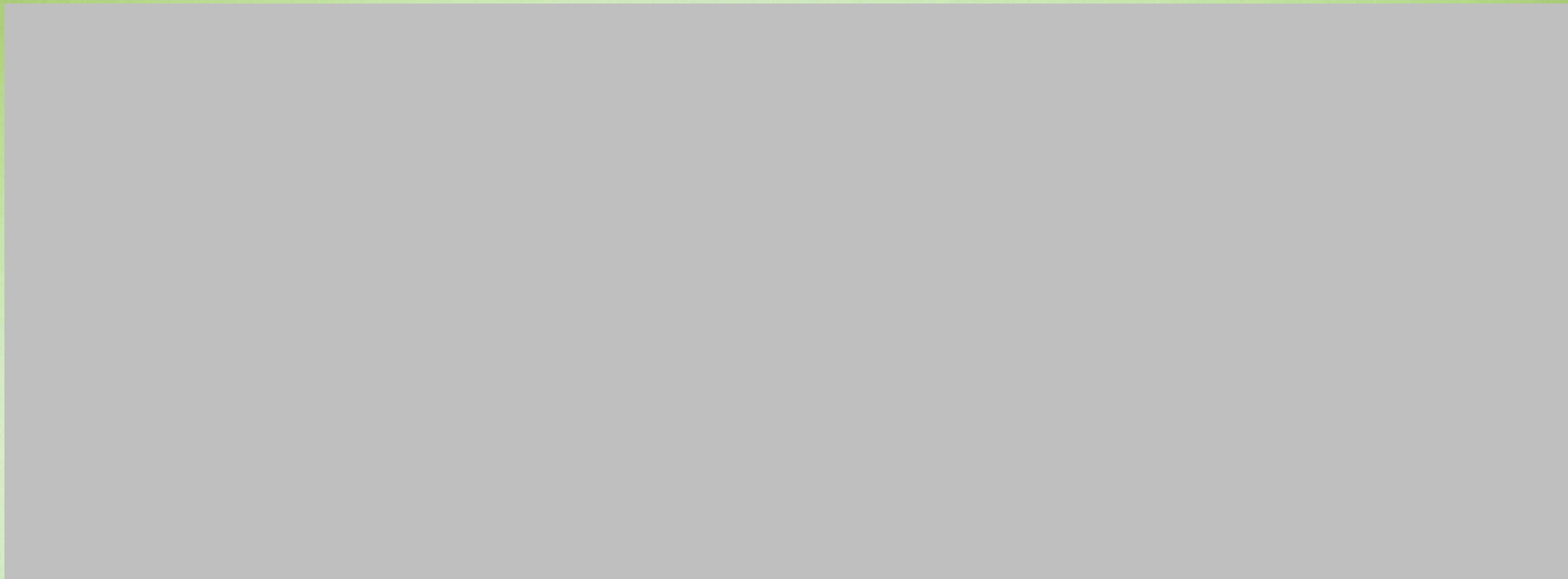
SINOPEC Glass Cleaner

■ performances

- Environmental friendly, with no content of alkyl phenol or branched alkyl surfactant.
- Highly compatible with plastic, rubber materials and metals.
- Excellent cleaning property.

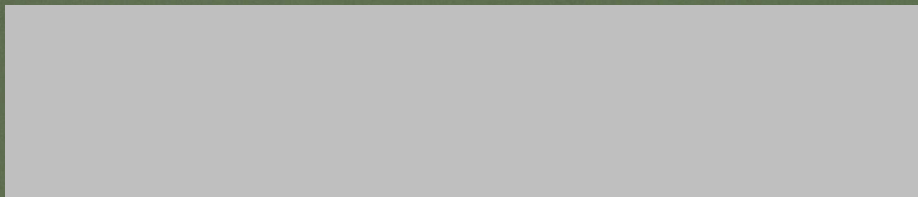
➤ The product can meet the requirements of PSA B71 5160, JISK 2398 and FAW for the specification of glass cleaners, and won certifications from such manufacturers as FAW Group Corporation, Dongfeng Peugeot-Citroen Automobile, Jianghuai Automobile, Xiamen King Long and Zhengzhou Nissan.

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