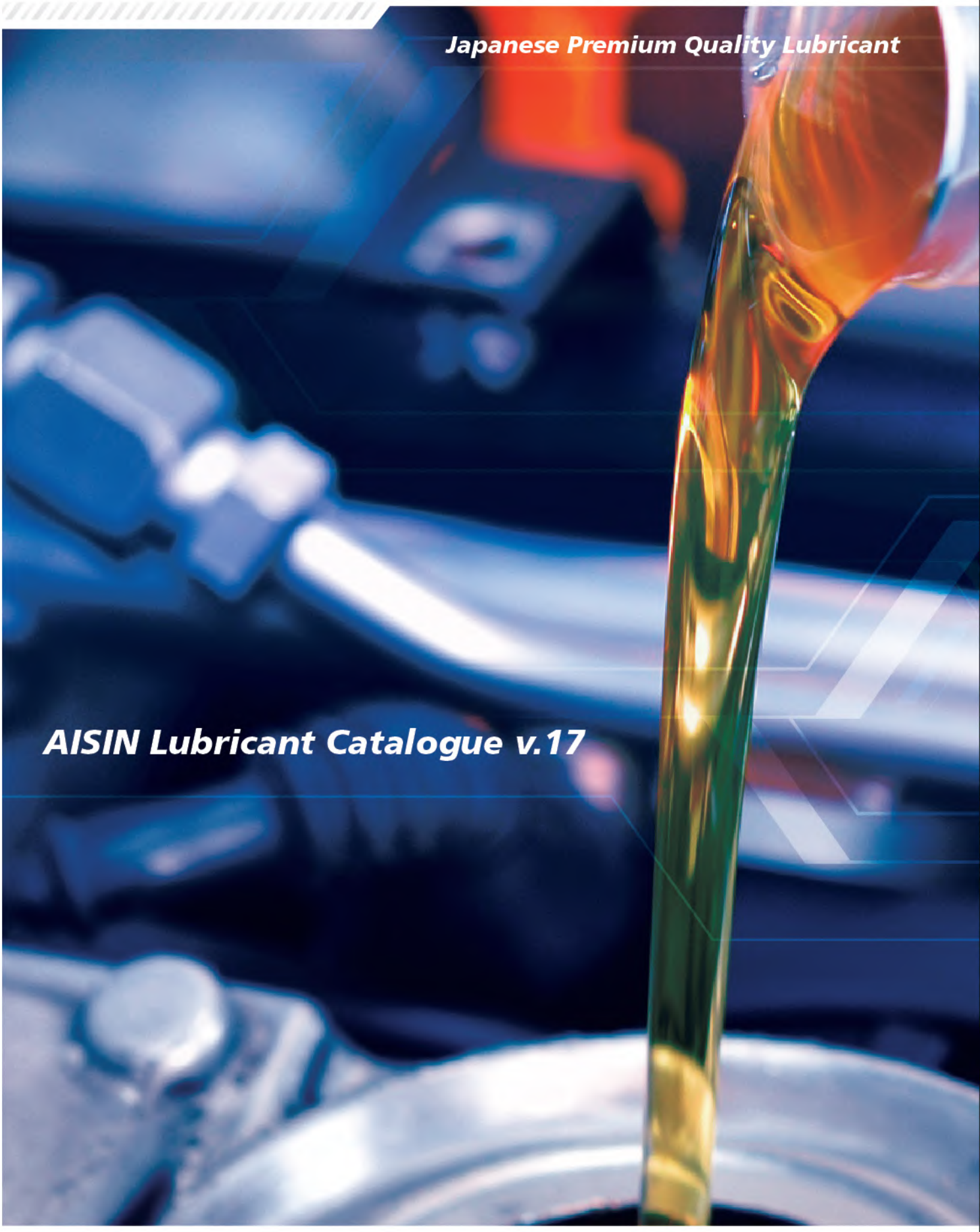
AISIN

Japanese Premium Quality Lubricant



AISIN Lubricant Catalogue v.17



01 ..... Table of Contents
02 ..... Which oil is right for you?
03-05 ..... Introduction of API and SAE systems
06-07 ..... Meet The AISIN Lubricant Family
08-09 ..... Premium Performance Engine Oil - AISIN Pao & Ester
10 ..... Gasoline Engine Oil
11 ..... GreenPower for Hybrid and Eco-car
12 ..... GreenPower, Advanced Technology CNG Engine Oil
13 ..... Greenergy
14 ..... Diesel Engine Oil (SF/CF, CF-4/SG)
15 ..... Diesel Engine Oil (CI-4/SL)
16 ..... Gear Oil
17-19 ..... Auto Transmission Fluid
20-21 ..... Auto Transmission Fluid Multi-Series
22 ..... Continuously Variable Transmission Fluid
23 ..... Motorcycle 4T Engine Oil for Scooter
24 ..... Motorcycle 4T Engine Oil
25 ..... Automotive Brake Fluid
26 ..... General Purpose Automotive and Industrial Grease
27 ..... Long Life Coolant / Anti-Freeze JIC
28-29 ..... FAQ
30 ..... Checklist



Base oil as the foundation of lubricant quality.

	Saturates	Sulfur	VI
Group I	< 90% and/or	> 0.03wt% and	80 ≤ VI <120
Group II	≥ 90% and	≤ 0.03wt% and	80 ≤ VI <120
Group III	≥ 90% and	≤ 0.03wt% and	120 ≤ VI
Group IV	PAO (Poly Alpha Olefin)		
Group V	Base oils which do not belong to the above Group I, II, III, IV		

- Viscosity is a measure of a 'fluid's resistance to flow.
- As the temperature of the liquid fluid increases its viscocity decreases.
- VI means change of viscosity with changing temperature. A high VI means a small change of viscosity over temperature.

Viscosity Grades : SAE-Engine Oil

SAE J300 Nov. 2007 (SAE: Society of Automotive Engineers)

SAE Viscosity Grade	Low Temp Cranking Vis., Max at Temp, cP at °C	Low Temp Pumping Vis., Max with no yield stress at Temp, cP at °C	High Temp Vis., cSt at 100°C		High Temp High Shear Vis. at 150°C, cP
			Min.	Max.	
0W	6,200 at -35	60,000 at -40	3.8	-	-
5W	6,600 at -30	60,000 at -35	3.8	-	-
10W	7,000 at -25	60,000 at -30	4.1	-	-
15W	7,000 at -20	60,000 at -25	5.6	-	-
20W	9,500 at -15	60,000 at -20	5.6	-	-
25W	13,000 at -10	60,000 at -15	9.3	-	-
20	-	-	5.6	< 9.3	2.6
30	-	-	9.3	< 12.5	2.9
40	-	-	12.5	<16.3	3.5 / 3.7
50	-	-	16.3	< 21.9	3.7
60	-	-	21.9	< 26.1	3.7

5W-30 is satisfied with the specification of 5W and 30 simultaneously.

Performance Classification Gear Oil



GRADE	Type	Application
GL-1	Straight Mineral Oil	Truck manual transmissions
GL-2	Usually contains fatty materials	Worm gear drives, industrial gear oils
GL-3	Contains mild EP additives	Manual Transmission and spiral bevel final drives
GL-4	Equivalent to obsolete Mil-L-2105 specification, usually satisfied with 50% of GL-5 additive level	Manual Transmissions, and Spiral bevel and hypoid gears in moderate service
GL-5	Virtually equivalent to present Mil-L-2105D, Primary field service recommendation of most passenger	Moderate and severe service in hypoid and other tpes of gears. May also be used in manual transmission cars and truck builders worldwide

Viscosity Grades : SAE-Gear Oil

(SAE J306 Oct. 91)

SAE Viscosity Grade	Maximum Temp for Vis. of 150,000cP	Viscosity at 100°C cSt	
		Min.	Max.
70W	-55	4.1	-
75W	-40	4.1	-
80W	-26	7.0	-
85W	-12	11.0	-
80	-	7.0	11.0
85	-	11.0	13.5
90	-	13.5	< 24.0
140	-	24.0	< 41.0
250	-	41.0	-

Viscosity Grades : ISO-Industrial Oil

(ISO: International Organization for Standardization)

ISO Viscosity Grade	Viscosity at 40°C cSt	
	Min.(-10%)	Max.(+10%)
32	28.8	35.7
46	41.4	50.6
68	61.2	74.5
100	90.0	110
150	135.0	165
220	198.0	242
~	~	~
1500	1350.0	1650

Multigrade: 75W-85W, 80W-90, 85W-140 etc.



API's Certification Mark and Service Symbol

identify quality motor oils for gasonline- and diesel-powered vehicles. Oils displaying these marks met performance requirements set by U.S. and international vehicle and engine manufacturers and the lubricant industry. More than 500 companies worldwide participate in this voluntary program, which is backed by a marketplace sampling and testing program.

The API Certification Mark also known as "Starburst"

An oil displaying this mark meets the current engine protection standard and fuel economy requirements of the International Lubricant Specification Advisory, Committee (ILSAC), a joint effort of U.S. and Japanese automobile manufacturers. Automobile manufacturers recommend oils than carry the API Certification Mark. See the **ISLAC STANDARD FOR PASSENGER CAR ENGINE OILS** chart on the next page for descriptions of current and obsolete ILSAC standards.



The API Service Symbol, also known as the "Donut"

1. Performance Level

Motor oils designed for cars, vans and light trucks with gasoline engines fall under API's "S" (Service) categories. Motor oils designed for heavy-duty trucks and vehicles with diesel engines fall under API's "C" (Commercial) charts on the next pages for descriptions of current and obsolete API service categories.

2. Viscosity Grade

The measure of an oil's ability to flow at certain temperature. Vehicle requirements may vary. Follow your vehicle manufacturer's recommendations on SAE oil viscosity.

3. Resource Conserving and Energy Conserving

These designations apply to oils intended for gasoline-engine cars, vans, and light trucks. Widespread use of "Resource Conserving" or "Energy Conserving" oil may result in an overall savings of fuel in the vehicle flees as a whole.



4. Multiple Performance Levels

Oils designed for diesel engine service might also meet gasoline engine service. For these oils the designation is "C" category first followed by the "S" category."C" category oils have been formulated primarily for diesel engines and may not provide all of the performance requirements consistent with vehicle manufacturer's recommendations for gasoline-fueled engines.

5. The API Service Symbol with CI-4 Plus

The "CI-4 PLUS" designation identifies oils formulated to provide a higher level of protection against soot-related viscosity increase and viscosity loss due to shear in diesel engines. When originally introduces, CI-4 PLUS identified CI-4 oils meeting a higher level of performance. CJ-4 oils include all CI-4 PLUS performance requirements. CI-4 PLUS appears in the lower portion of the API Service Symbol "Donut".

The current and previous ISLAC standars and API Service Categorie are listed here. Vehicle owners should refer to their owner's manual before consulting these charts. Oils may have more than one performance level.

For automotive gasoline engines, the latest ILSAC standard or API Service Category includes the performance properties of each earlier category and can be used to service older engines wehere earlier category oils were recommended.

ILSAC STANDARD FOR PASSENGER CAR ENGINE OILS

Name	*Status*	*Service*
GF-5	Current	Introduced in October 2010, designed to provide improved high temperature deposit protection for pistons and turbocharges, more stringent sludge control, improved fuel economy, enhanced emission control system compatibility, seal compatibility, and protection of engines operating on ethanol-containing fuels up to E85.
GF-4	Obsolete	Use GF-5 where GF-4 is recommended.
GF-3	Obsolete	Use GF-5 where GF-3 is recommended.
GF-2	Obsolete	Use GF-5 where GF-2 is recommended.
GF-1	Obsolete	Use GF-5 where GF-1 is recommended.

GASOLINE ENGINES (Follow your vehicle manufacturer's recommendation on oil performance levels)

Category	*Status*	*Service*
SN	Current	Introduced in October 2010 for 2011 and older vehicles, designed to provide improved high temperature deposit protection for pistons, more strigent sludge control, and seal compatibility. API SN with Resource Conserving matches ILSAC GF-5 by combining API SN performance with improved fuel economy, turbocharger protection, emission control system compatibility, and protection of engines operating on ethanol-containing fuels up to W85.
SM	Current	For 2010 and older automotive engines.
SL	Current	For 2004 and older automotive engines.
SJ	Current	For 2001 and older automotive engines.
SH	Obsolete	**OBSOLETE:** For 1996 and older automotive engines.
SG	Obsolete	**CAUTION:** Not suitable for use in most gasoline-powered automotive engines built after 1993. May not provide adequate protection against build-up of engine sludge.
SF	Obsolete	**CAUTION:** Not suitable for use in most gasoline-powered automotive engines built after 1988. May not provide adequate protection against build-up of engine sludge.
SE	Obsolete	**CAUTION:** Not suitable for use in gasoline-powered automotive engines built after 1979.
SD	Obsolete	**CAUTION:** Not suitable for use in gasoline-powered automotive engines built after 1967. Use in more modern engines may cause unsatisfactory performance or equipment harm.
SC	Obsolete	**CAUTION:** Not suitable for use in gasoline-powered automotive engines built after 1979. Use in more modern engines may cause unsatisfactory performance or equipment harm.
SB	Obsolete	**CAUTION:** Not suitable for use in gasoline-powered automotive engines built after 1951. Use in more modern engines may cause unsatisfatory performance or equipment harm.
SA	Obsolete	**CAUTION:** Contains no additives. Not suitable for use in gasoline-powered automotive engines built after 1930. Use in more modern engines may cause unsatisfactory performance or equipment harm.

DIESEL ENGINES (Follow your vehicle manufacturer's recommendation on oil performance levels)

Category	Status	Service
CJ-4	Current	For high-speed four-stroke cycle diesel designed to meet 2010 model year on-highwat and Tier 4 nonroad exhaust emission standards as wel as for preious model year diesel engines. These oils are formulated for use in all applications with diesel fuels ranging in sulfur content up to 500ppm (0.05% by weight). However, the use of these oils with greater than 15ppm (0.0015%) sulfur fuel may impact Exhaust after-treatment system durability where particulate filters and other advanced after-treatment systems are used. Optimum protection is provided for control o catalyst poisoning, particulate filter blocking, engine wear, piston deposits, loss-and high-temperature stability, soot handling properties, oxidative thickening, foaming, and Viscosity loss due to shear. API CJ-4 oil exceed the performance criteria of API CI-4 with CI-4 PLUS, CI-4, CH-4, CG-4 and CF-4 and can efectively lubricate engines calling for those API servie Categories. When using CJ-4 oil with higher than 15ppm sulfur fuel, consult the engine manufacturer for service interval.
CI-4	Current	Introduced in 2002. For high-speed, four-stroke ngines designed to meet 2004 exhaust emission standards implemented in 2002. CI-4 oils are formulated to sustain engine durability where exhaust gas recirculation (EGR) is used and are intended for use with diesel fuels ranging in sulfur content up to 0.5% weight. Can be used in place of CD, CE, CF-4, CG-4 and CH-4 oils. Some CI-4 oils may also qualify for the CI-4 PLUS designation.
CH-4	Current	Introduced in 1998. For high-speed , four-stroke engines using fuel with less than 0.5% weight sulfur. CH-4 oils are specifically compounded for use with diesel fuels ranging in sulfur content up to 0.5% weight. Can be use in place of CD, CE, CF-4 and CG-4 oils.
CG-4	Obsolete	**OBSOLETE:** Introduced in 1995. For severe duty, high-speed, four-stroke engines using fuel with less than 0.5% weight sulfur. CG-4 oils are required for engines meeting 1994 emission standards. Can be used in place of CD, CE and CF-4 oils.
CF-4	Obsolete	**OBSOLETE:** Introduced in 1990. For high-speed, four-stroke, naturally aspirated and turbocharged engines. Can be used in place of CD and CE oils.
CF-2	Obsolete	**OBSOLETE:** Introduced in 1994. For severe duty, two-stroke-cycle engines. Can be used in place of CD-II oils.
CF	Obsolete	**OBSOLETE:** Introduced in 1994. For off-road, indirect-injected and other diesel engines inluding those using fuel with over 0.5% sulfur. Can be used in placed of CD oils.
CE	Obsolete	**CAUTION:** Not suitable for use in most diesel-powered engines built after 1994.
CD-II	Obsolete	**CAUTION:** Not suitable for use in most diesel-powered engines built after 1994.
CD	Obsolete	**CAUTION:** Not suitable for use in most diesel-powered engines built after 1994.
CC	Obsolete	**CAUTION:** Not suitable for use in most diesel-powered engines built after 1990.
CB	Obsolete	**CAUTION:** Not suitable for use in most diesel-powered engines built after 1961.
CA	Obsolete	**CAUTION:** Not suitable for use in most diesel-powered engines built after 1959.

SAE VISCOSITY GRADES: PASSENGER CAR MOTOR OIL

Multigrade oils such as SAE 5W-30 and 10W-30 are widely used because, under all but extremely hot or cold conditions, they are thin enough to flow at low temperatures and thick enough to perform satisfactorily at high temperatures. Note that vehicle requirements may vary.
Follow your vehicle manufacturer's recommendation on SAE oil viscosity grade.

If lowest expected outdoor temperature is	Typical SAE viscosity grades for passenger cars
0°C(32°F)	0W-20, 0W-30, 5W-20, 5W-30, 10W-30, 10W-40, 20W-50
-18°C (0°F)	0W-20, 0W-30, 5W-20, 5W-30, 10W-30, 10W-40
Below -18°C (0°F)	0W-20, 0W-30, 5W-20, 5W-30

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AISIN
I am protected by AISIN
The Premium Quality Lubricants & Automotive Parts
A member of Toyota group
AISIN Fully Synthetic Motor Oil
AISIN Gear Oil
AFW+
SN/CF 5W-40
GL-5 80W-90
BRAKE BOOSTER
CLUTCH DISC
ADVICS
AISIN SEIKI Co., Ltd.
The linchpin of the 187 companies that make up the AISIN Group. The AISIN Group's exhaustive product line comprehensively covers virtually every element of an automobile, from transmission and other drivetrain-related products to the brake-system, chassis-system, engine body parts and information-related products. Our products are incorporated into vehicles produced by automakers worldwide.
Aftermarket-Related
Besides building on our strengths as a comprehensive manufacturer of automotive parts, AISIN also supplies the global aftermarket product such as clutches, water pumps, auto-transmission fluids, hydraulics items, lubricant oil products and wide range of other auto parts into the market.
www.aisin.com.sg



0W-30 SN/CF | 0W-40 SN/CF | 5W-30 SN/CF | 5W-40 SN/CF

FULLY - PAO & ESTER



0W-20 SN | Eco 5W-30 | Eco 5W-40 | 5W-30 SN/CF | 5W-40 SN/CF | 5W-50 SN/CF

FULLY SYNTHETIC

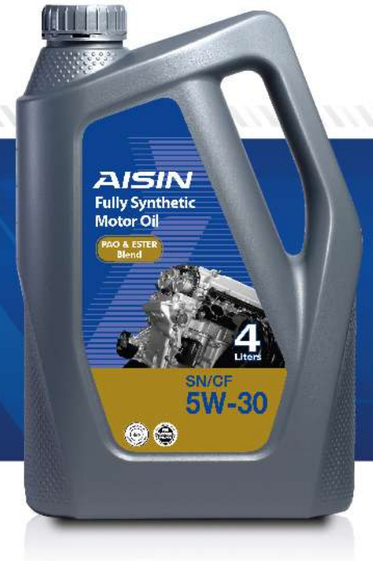


10W-30 SN/CF | NGV 15W-40 SL | 10W-40 SN/CF | Eco 10W-30 SN/CF | 20W-50 SN/CF | Eco 15W-40 CI-4/SL | 15W-40 CI-4/SL

SEMI SYNTHETIC

AISIN PAO & ESTER

Premium Fully-Synthetic Engine Oil



- 100% Poly-Alpha-Olefin (PAO) Group IV base oil formulation synthetic oil which is mainly use for Aircraft engine oil.
- 100% Ester Based synthetic Group V base oil which is use to balance the effect of seals, solubilize additives and improve energy efficiency through higher lubricity.
- **PERFORMANCE STANDARD: SN/CF**

DESCRIPTION

Premium performance, multi-grade motor oil formulated from selected synthetic base fluids and race-proven additive technology for use in passenger car and light truck gasoline engines and passenger car diesel engines under all operating conditions.

WIDE RANGE & MULTI-PURPOSE APPLICATIONS

Naturally aspirated Gasoline engines, LPG and Diesel engines in passenger cars, RV and SUVs (Sport Utility Vehicles), light truck gasoline and diesel engines (Four-stroke gasoline engines in Motorcycles and portable power equipment where the manufacturer recommends conventional passenger car motor oils).

SUPERIOR PROPERTIES

SAE Grade	0W-30	0W-40	5W-30	5W-40
Density, kg/L @15°C	0.755	0.804	0.803	0.833
Kinematic Viscosity, mm²/s @ 40°C	60.22	85.42	60.23	70.45
Kinematic Viscosity, mm²/s @ 100°C	10.87	14.94	11.65	14.57
Viscosity Index	176	193	173	177
Pour Point °C	-48	-54	-45	-45
Flash Point °C	211	210	222	221
Package (Liters)	1L, 4L, 200L	1L, 4L, 200L	1L, 4L, 200L	1L, 4L, 200L

UNIQUE ADVANTAGES

Poly-Alpha-Olefin (PAO)

PAOs, synthetic base fluids manufacture by carefully controlled chemical reaction of alphaolefin, have extreme stability and high performances in cold property and robustness, mainly used for the most premium lubricant products.

Ester

It use to balance the effect of seals, solubilize additives and improve energy efficiency through higher lubricity.

Cold Property

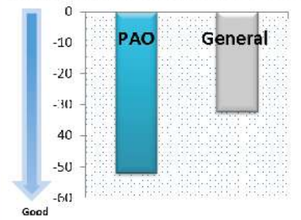
With their excellent cold property, PAOs can be used in extremely cold ambient temperature without oil change.

Robustness

PAOs have excellent anti-oxidation stability and low volatility, which allows the oil to maintain its original properties longer and significantly reduced sludge extending the oil drain interval.

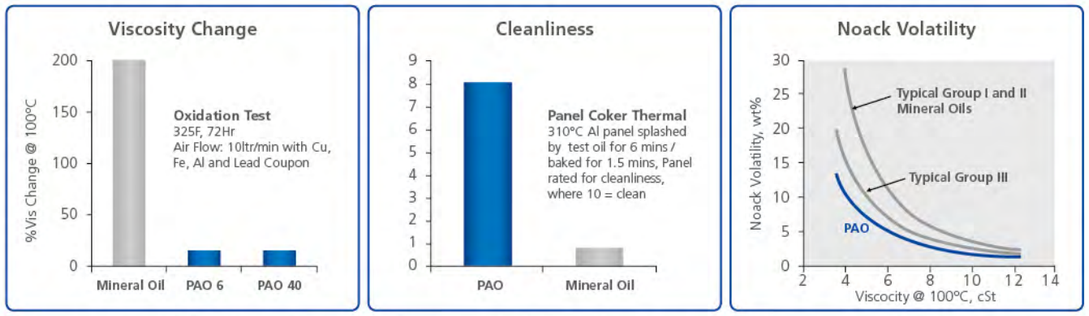
Pour Point

(Temperature below which the oil does not flow by itself)





PAO has high viscosity index between 150 – 250



Viscosity increased at thigh temperature is significantly less.

Cleanliness in high temperature is much higher than others.

Low volatility makes oil to be used in longer time.



Mercedes C220: 96,540km

Mercedes C220: 96,540km

Mercedes C220: 193,080km

Anti-Wear

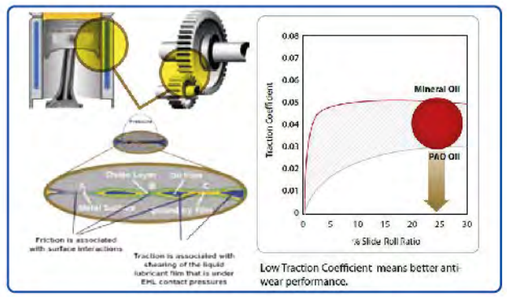
PAOs have excellent anti-wear performance in extreme pressurized friction thanks to their solid molecular structure.

Field Test

Field test results shows that AISIN PAO+Ester products, formulated with premium additives approved from API, ACEA and OEM recent specification, have excellent performance in low sludge and anti-wear characteristics.

Customer Benefits

- Maximizes engine life
- Maximizes power and performance
- Low oil consumption
- Longer equipment life
- Lower impact emiisions



Low Traction Coefficient means better anti-wear performance.

AISIN

High Performance Gasoline Engine Oil

- PERFORMANCE STANDARD: SN/CF



DESCRIPTION

High Performance additives systems and leading edge viscosity index improver by meeting the requirement of current advances top-tier engine oil grade of API SN and ISLAC GF-5. It is optimized to provide complete engine oil performance especially for fuel efficiency, reducing friction loss and durability.

WIDE RANGE & MULTI-PURPOSE APPLICATIONS

All passenger car and light truck four-cycle gasoline engines and cards equipped with DOHC, EFI and VVT, both naturally aspirated and turbocharged.

SUPERIOR PROPERTIES

SAE Grade	Fully Synthetic 5W-30	Fully Synthetic 5W-40	Fully Synthetic 5W-50	Semi Synthetic 10W-30	Semi Synthetic 10W-40
Density, kg/L @15°C	0.8526	0.8527	0.8521	0.8623	0.8646
Kinematic Viscosity, mm²/s @ 40°C	59.6	83.91	113.8	64.89	105.1
Kinematic Viscosity, mm²/s @ 100°C	10.24	14.5	18.81	10.13	15.29
Viscosity Index	162	183	184	144	160
Pour Point °C	-39	-42	-42	-42	-39
Flash Point °C	220	216	218	216	210
Package (Liters)	1L, 3L, 4L, 5L, 200L	1L, 4L, 5L, 200L	1L, 4L, 200L	1L, 3L, 4L, 5L, 200L	1L, 3L, 4L, 200L

Customer Benefits

- Fuel economy
- Engine power and maintainability
- Oil drainage interval
- All-temperature wear resistance

Performance Standards

- 5W-30 : SN/GF-5/RC/CF
- 5W-40 : SN/CF
- 5W-50 : SN/CF
- 10W-30 : SN/GF-5/RC/CF
- 10W-40 : SN/CF



AISIN GREENPower

High Performance Diesel Engine Oil for Hybrid and Eco-Car

• PERFORMANCE STANDARD: SN / GF-5 / RC/CF

DESCRIPTION

High Performance additives systems and leading edge viscosity index improver by meeting the requirement of current advances top-tier engine oil grade of API SN and ISLAC GF-5. Formulated from synthetic technology base oil and it is optimized to provide complete engine oil performance especially for fuel efficiency, reducing friction loss and durability.

WIDE RANGE & MULTI-PURPOSE APPLICATIONS

All passenger cars and light truck four-cycle gasoline engines both naturally aspirated and turbocharged. It is suitable for both Hybrid and Eco-Car application. Gas–fuel (natural gas and LPG) spark ignition engines where conventional passenger car motor oils are commended.

SUPERIOR PROPERTIES

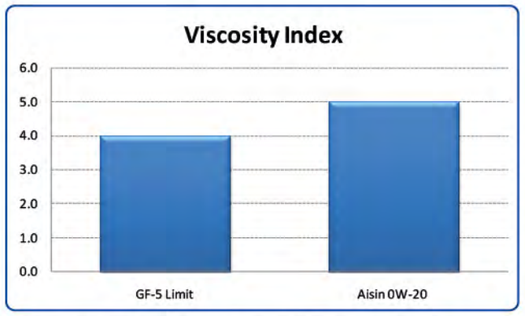
SAE Grade	0W-20
Density, kg/L @15°C	0.8493
Viscosity, mm²/s @ 40°C	42.17
Viscosity, mm²/s @ 100°C	8.195
Viscosity Index	169
Pour Point °C	-45
Flash Point °C	238
Package (Liters)	1L, 4L, 200L

UNIQUE ADVANTAGES

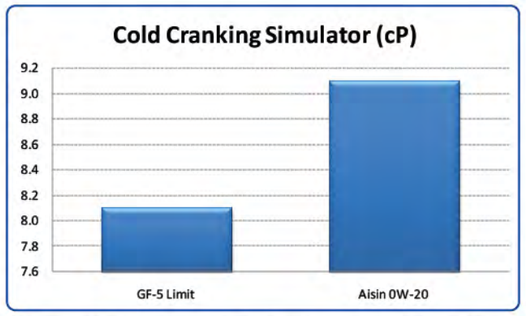
100% synthetic VHVI (Very High Viscosity Index) base oil formulated with premium additives which meets the requirements of API SN grade specification. They have excellent cold temperature performance and fuel efficiency thanks to their enhanced and anti-oxidation, cleanliness and catalyst protection properties.

Customer Benefits

- Extra Fuel Economy Saver
- Ultra Cleaning and Long Life Power
- Superior Cold Performance
- Saves on maintenance costs



Improved piston cleanliness protects blow-by gas to increase engine power.



High performance in engine sludge increase engine durability and anti-wear, which provides benefits in car maintenance.



AISIN GREENPower

Advanced Technology CNG Engine Oil for Passenger Car

• PERFORMANCE STANDARD: API SL

DESCRIPTION

Premium performance, highly shear-stable, multi-grade CNG engine oil for use in passenger car, RV (SUV) car and CNG Taxi engines operating under the most severe conditions. Formulated from High Quality base oil and the latest technology additives, it is optimized to provide complete engine protection against: Starting friction / Heat stress / Engine deposits

WIDE RANGE & MULTI-PURPOSE APPLICATIONS

- CNG engine of passengers cars
- RV Car and SUV car
- Taxi using compressed natural gas (CNG), Dual Fuel-Engine

SUPERIOR PROPERTIES

	Semi Synthetic	Semi Synthetic
SAE Grade	5W-30	15W-40
Density, kg/L @15°C	0.8542	0.865
Kinematic Viscosity, mm²/s @ 40°C	61.3	102.9
Kinematic Viscosity, mm²/s @ 100°C	10.17	14.99
Viscosity Index	161	148
Pour Point °C	-45	-45
Flash Point °C	250	236
Package (Liters)	1L, 4L, 200L	1L, 4L, 200L

Customer Benefits

- Maximizes engine life through superior wear and deposit control under all operating conditions
- Provides significant fuel savings by reducing frictional losses.
- Protects against start-up wear in cold conditions through excellent low-temperature fluidity.
- Maintains power and economy by minimizing wear in even the most sophisticated valve train mechanisms, including those with variable valve timing.
- Helps to preserve emissions and fuel economy performance by protecting converters and oxygen sensors evaporation.



AISIN GREENergy

Eco-Friendly Gasoline Engine Oil for vehicle fitted with Diesel Particulate Filter (DPF)

- PERFORMANCE STANDARD:
  SM/CF, ACEA 3; CJ-4/SM, ACEA 9

DESCRIPTION

High Performance additives systems and leading edge viscosity index improver by meeting the requirement of current advances top-tier engine oil grade of API SN and ISLAC GF-5. It is optimized to provide complete engine oil performance especially for fuel efficiency, reducing friction loss and durability.

WIDE RANGE & MULTI-PURPOSE APPLICATIONS

All passenger car and light truck four-cycle gasoline engines and cards equipped with DOHC, EFI and VVT, both naturally aspirated and turbocharged. It is highly recommended for vehicle fitted with Diesel Particulate Filter (DPF) features.

SUPERIOR PROPERTIES

SAE Viscosity	Fully Synthetic (PAO+Ester) 15W-40 (CJ-4/SM)	Semi Synthetic 10W-30	Semi Synthetic 15W-40 (CJ-4/SM)
Density, kg/L @15°C	0.8689	TBC	0.8681
Kinematic Viscosity, mm²/s @ 40°C	120.8	TBC	117.2
Kinematic Viscosity, mm²/s @ 100°C	16.11	TBC	16.07
Viscosity Index	142	TBC	147
Pour Point °C	-39	TBC	-39
Flash Point °C	248	TBC	242
Base Number, mg KOH/g	10.08	TBC	9.6
Package (Liters)	5L, 20L, 200L	5L, 200L	4L, 5L, 18L, 200L

Customer Benefits

- Fuel economy
- Engine power and maintainability
- Oil drainage interval
- All-temperature wear resistance



AISIN

High Performance Diesel Engine Oil

- PERFORMANCE STANDARD:
  SF/CF, CF-4/SG

DESCRIPTION

High performance, multi-grade diesel engine oil specifically designed to lubricant a wide range of diesel and gasoline engines requiring API CF-4 performance lubricants. Formulated in synthetic technology base oil ad high performance additives, optimize to provide outstanding protection and lubricity in all passenger car and light truck gasoline engines.

WIDE RANGE & MULTI-PURPOSE APPLICATIONS

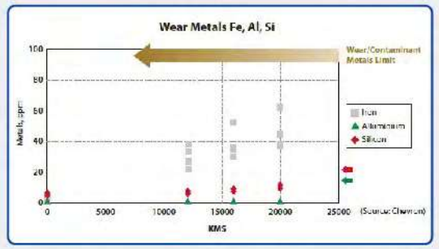
All passenger car and light truck four-cycle gasoline engines both naturally aspirated and turbocharged. Mixed fleets of diesel engines (high-speed, four-stroke, naturally aspirated and turbocharged), commercial road transport and small diesel engines in marine service (e.g. fishing, river transport etc.)

SUPERIOR PROPERTIES

SAE Viscosity	20W-50 (CF-4/SG)	20W-50 (SF/CF)
Density, kg/L @15°C	0.867	0.871
Kinematic Viscosity, mm²/s @ 40°C	173.5	150.6
Kinematic Viscosity, mm²/s @ 100°C	20.29	18.96
Viscosity Index	136	126
Pour Point °C	-33	-33
Flash Point °C	262	236
Base Number, mg KOH/g	9	-
Package (Liters)	1L, 4L, 6L, 20L, 200L	1L, 3L, 4L, 5L, 6L, 20L, 200L

UNIQUE ADVANTAGES

AISIN High Performance Diesel engine oil maintains power output by providing outstanding deposit control. With the anti-wear additive system, AISIN Diesel engine oil reduces wear in severe service by forming a protective layer on all metal contact surfaces.



Customer Benefits

- Maximum power output
- Reduced maintenance costs



AISIN
High Performance Diesel Engine Oil

• PERFORMANCE STANDARD: CI-4/SL

DESCRIPTION
High performance, multi-grade, heavy-duty diesel engine oil specifically designed to lubricant a wide range of diesel and gasoline engines requiring API CI-4, SL, ACEA E7 performance lubricants operating under the most severe conditions.

WIDE RANGE & MULTI-PURPOSE APPLICATIONS
Wide range of mixed fleets of European, North American diesel engine (high speed, four stroke, turbocharged naturally aspirated) including both old and new equipment of commercial road transport (heavy trucks, buses, Stop-and-go vehicles, off-highway vehicles); Heavy construction equipment's including excavator, wheel loader, forklift and dozer; Small diesel engines in marine service; Generator sets and Powershift transmissions.

SUPERIOR PROPERTIES

SAE Viscosity	Fully Synthetic 10W-40	Semi Synthetic 15W-40	Semi Synthetic 15W-40 (CF-4/SG)
Density, kg/L @15°C	0.8612	0.8748	0.8694
Kinematic Viscosity, mm²/s @ 40°C	104.8	111.8	112.5
Kinematic Viscosity, mm²/s @ 100°C	15.58	14.76	14.98
Viscosity Index	158	136	138
Pour Point °C	-42	-33	-39
Flash Point °C	226	240	252
Base Number, mg KOH/g	10.23	9.45	10.2
Package (Liters)	1L, 4L, 5L, 6L, 20L, 200L	1L, 4L, 5L, 6L, 20L, 200L	1L, 4L, 5L, 6L, 20L, 200L

UNIQUE ADVANTAGES
AISIN high performance diesel engine oil has excellent performance for sustaining durability with EGR system. It protects sludge formed by sulfur and fuel combustion without the need for overly shortened drain intervals.

Customer Benefits
- Minimize fleet maintenance costs
- Minimize fleet operating costs
- Extends engine life to overhaul



AISIN
High Performance Gear Oil

• PERFORMANCE STANDARD: GL-5 / MIL-L-2015D

DESCRIPTION
High-performance, multipurpose, thermally stable, EP automotive gear lubricant. GL-5 designates the type of service characteristic of gears, particularly hypoids in automotive axles under high-speed and/or low-speed, high-torque conditions. Lubricants qualified under U.S. Military specification MIL-L-2105D (formerly MIL-L-2015C), MIL-PRF-2105E and SAE J2360 satisfy the requirements of the API GL-5 service designation.

WIDE RANGE & MULTI-PURPOSE APPLICATIONS
Recommended for automotive hypoid gear applications requiring lubricants meeting MIL-PRF-2105E, MIL-L-2105D, MIL-L-2105C, MIL-L-2105B, Service GL-5 or where EP, multi-purpose or hypoid type gear oils are specified. It is also recommended where loading is severe and maximum gear protection is required. 'Clean gear' technology makes it particularly suitable where gear oil temperatures are high. Not recommended for manual transmission and transaxles where the manufacturer specifies APL GL-4 (mid-EP) lubricants, or where the manufacturer advises against the use of API GL-5 (multipurpose, hypoid) lubricants.

SUPERIOR PROPERTIES

SAE Viscosity	80W-90 (Non-LSD)	80W-90 (LSD)	85W-140 (Non-LSD)
Density, kg/L @15°C	0.8612	0.8794	0.8968
Kinematic Viscosity, mm²/s @ 40°C	132.1	144.1	313.5
Kinematic Viscosity, mm²/s @ 100°C	14.51	14.6	24.85
Viscosity Index	110	110	101
Pour Point °C	-33	-36	-21
Flash Point °C	208	232	210
Package (Liters)	1L, 4L, 20L, 200L	4L, 20L, 200L	1L, 4L

UNIQUE ADVANTAGES
High performance, thermally stable, EP automotive gear lubricant (API GL-5, MIL-L-2105D, SAE 80W-90, 85W-140)

Very Good Anti-wear Performance

High quality base oil and additive provide good resisting gear wear and scuffing under severe conditions



Outstanding thermal & oxidation stability

GSC product is superior to other products in oxidation test under 150°C, 96 hours. (Oxidation Test Method : JIS K2514)



AISIN

Premium Quality Automatic Transmission Fluids from World Largest AT Manufacturer



I am Protected by AISIN

Premium lubricant product for transmission, widely used by more than 40 carmakers around the world. AISIN is the world largest AT supplier with 50 years experiences in manufactured AT transmission. Make your trust beyond your trip.

Why choose AISIN ATF?

- Economical and save your gasoline more
- Improve your fuel consumption, save your gasoline more.
- Longest transmission life span



Unique of AISIN ATF

Who is AISIN?

AISIN SEIKI was founded in 1949, Aisin is a Fortune Global 500 company. Automatic Transmission, one of AISIN's main product, has been widely used by more than 40 carmakers around the world. One from every five A/T vehicles uses AISIN's Automatic Transmission. AISIN is the world largest A/T supplier. Amongst makers who has the capability to design and manufacture A/T, as well as high quality ATF, AISIN is one of the best company. AISIN product quality is superior than of OEM products.

ATF Knowledge:

Ever since the development of A/T, the electronic and hydraulic components has became more complicated. Therefore it is very important to service A/T regularly. In general, carmakers suggest changing ATF every 60~80k KM, some carmakers even suggest for lifetime maintenance free. This suggestion has to be viewed from many aspects. With the higher quality living standards and deteriorating traffic condition, AISIN suggests car owners to change ATF every 2 years or 20000km.Witout proper maintenance for the ATF, it will reduce your car performance, higher fuel consumption, or causing damage to the transmission.

Advantageous of regular ATF maintenance:



Improved shift feel

Improved fuel consumption

Longer transmission life span

ATF under normal usage



ATF under excessive usage



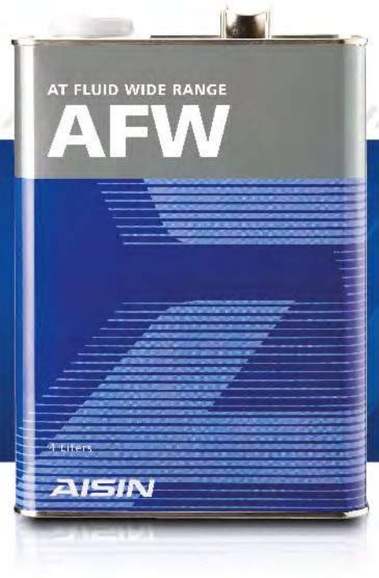
Mixed with debris
Need to repair transmission (metal debris will cause abrasion)

High temperature (paste-like)
Need to repair transmission (will cause wet clutch slip)

Milky (mixed with water)
Need to repair transmission (water mixed into transmission)

Change ATF every 2 years or 20000km can well keep your transmission and prevent major repair. Hence it will help car owner to save time and money.

©TORUKON KIKI CO.,LTD.



AISIN
Fully Synthetic Automatic Transmission Fluid

DESCRIPTION
AFW is superior to any other past or current ATF for uses in passenger car with automatic transmission system. It provides a higher quality performance due in part by its oxidation resistance, low temperature fluidity, appropriate friction performance, high shear stability, and near sludge free operation.

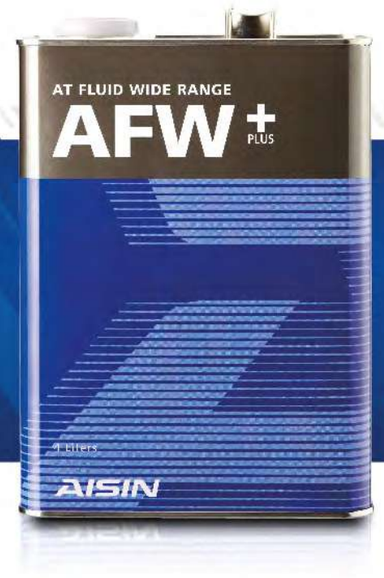
APPLICATIONS
In accordance with the GM powertrain licensing requirements for the use of the DEXRON trademark, ATF DX-III maybe recommended for us in automatic transmissions or other units, such as power-steering systems, industrial hydraulic systems and air compressors for which the service-fill product is specified as DEXRON II E, DEXRON II or DEXRON fluid.

SUPERIOR PROPERTIES

Automatic Transmission FLuid	AFW
Density, kg/L @15°C	0.8423
Kinematic Viscosity, mm²/s @ 40°C	33.72
Kinematic Viscosity, mm²/s @ 100°C	7.123
Pour Point °C	-48
Flash Point °C	238
Brookfield Viscosity, cP @ -20°C	1,388
Brookfield Viscosity, cP @ -40°C	10,256

Performance Standard:
- General Motors Dexron III
- Ford MERCON
- Allison C4

Customer Benefits
- Provides high foam stability
- Ensure long life time
- Provides high anti-rusting performance and lower sludge formation
- Provides more stable friction property



AISIN
Fully Synthetic Automatic Transmission Fluid Multi-Series

DESCRIPTION
High performance, High-quality, multi-vehicle fluid for Automatic Transmissions specially formulated fluid designed to meet the requirements of a wide range of automatic transmission specification requiring SP-II, SP-III, DEXRON III, MERCON V, Allison C4, Toyota T-III, IV and WS. Applicable for Slip Controlled Lock-up Clutch.

Customer Benefits
- Anti shudder protection Oxidation and thermal stability
- Provide high foam stability
- Provides good start operation in cold climates thanks to its excellent low-temperature fluidity
- Provides more stable friction property

WIDE RANGE & MULTI-PURPOSE APPLICATIONS
*Please refer to the application table attached.

SUPERIOR PROPERTIES

Automatic Transmission FLuid	AFW+
Density, kg/L @15°C	0.8464
Kinematic Viscosity, mm²/s @ 40°C	36.69
Kinematic Viscosity, mm²/s @ 100°C	7.411
Pour Point °C	-48
Flash Point °C	226
Brookfield Viscosity, cP @ -20°C	1,341
Brookfield Viscosity, cP @ -40°C	13,800

AT FLUID WIDE RANG PLUS (AFW+)

AUTOMAKER	VEHICLE TYPE	SPECIFIED GENUINE ATF
Toyota	FF-based 4WD vehicles	ATF Type-T
	Used for 3000cc or bigger	ATF T-II
	Flex lock up vehicles	ATF T-III
	Used for both 3000cc or more and flex lockup vehicles Type T-II and T-III were integranted	ATF Type-IV
	Toyota vehicles other than those above	ATF Dexron II-E
	Cavalier, Duet	ATF Dexron III
	Celsior, Crown (6AT), Land Cruiser 100 (5AT), Prius	ATF WS
	General AT truck and Bus (under 4T)	ATF Dexron II and T-IV
Nissan	General AT vehicles	Matic Fluid-D**
	X-Trail, Cima, Skyline 5AT, Fairlady Z	Matci Fluid-J
	Oct,2007~Skyline coupe, El Grand, Fuga 5AT	Matic Fluid-S
	Vaette	Matic Fluid-C, D / ATF M-III
	General AT truck and bus (Under 4T)	Besco ATF III
UD	General AT truck and Bus (Under 4T)	Besco ATF III
Hino	General AT truck and Bus (under 4T)	ATF Dexron II / T-IV
Mazda	General AT vehicles ATF S-1 and N-1 have been integrated into M-III	ATF M-III
	Roadstar (6AT)	ATF JWS 3317
	Premacy, Atenza, Demio, MPV, Axela	ATF M-V
	Tribute	ATF F-1
	General trucks and bus under 4t	Besco ATF III
Subaru	General AT vehicles	Subaru ATF, Subaru ATF (5AT)**
		ECVT Fluid**
	Traviq	Opel Original ATF 09117946
Suzuki	General AT vehicles	ATF Dexron II E
	Escudo.Alto.Cervo.Carry.Jimny. Wagon R, X-90 (3AT)	ATF 5D06
	Escudo,Cultus,Alto,Wagon R	ATF 2384K
	Eletronic Control 4AT	ATF 3314 / 3317
Isuzu	General AT vehicles	Besco ATF II/III
		Besco Dexron II-E
	General small bus & truck (under 4t)	Besco ATF III
Mitsubishi	FF vehicles and passenger car base FR vehicles (other than CVT)	Dia Queen ATF SP II/ SP II M/ SP III
	ALL FR cars which are AT	Dia Queen ATF SP III**
	Pajero io (non-turbo)	Dia Queen ATF II**
	Pajero io (turbo)	Dia Queen ATF AW
	Outlander (6AT)	Dia Queen ATF J2
	Delica Van, Truck	Dia Queen ATF SK
Honda	General AT vehicles (including S-Matic, F-Matic, 5AT)	Honda Ultra ATF/ATF Z1**
	General AT vehicles	Honda Ultra ATF DW-1
	General AT vehicles	Honda Ultra ATF-Z1
Dahaitsu	General AT vehicle	Ammix ATF DIII Multi
	General AT vehicles	Ammix ATF D3-SP
Perodua	Kancil, Viva, Kelisa, Kenari, Kembara	ATD D-III (ATF Dexron III)
	Myvi, New Myvi, Nautica, Alza	P2-ATF D3 - SP (ATF DEXRON III - SP)

AISIN

Fully Synthetic Continuously Variable Transmission Fluid



DESCRIPTION

CFEx is a premium quality transmission fluid designed to meet the service fill use in a broad range of Continuously Variable Transmission (CVT). This CVT fluid is specially formulated to provide excellent driving comfort, longer lifer of transmission, extended service interval, excellent wear control and durability between the belt and pulley. AISIN CFEx is recommended for use in all of the push belt type CVT. However, it is not recommended to be used in chain type CVTs such as Audi Multitronic or Subaru Lineartronic and in power split type CVTs which is equipped with Toyota Prius.

Customer Benefits

- Compatibility in multiple CVT Transmission types
- Superior anti-shudder durability
- Prevent wear at the metal-to-metal contact points on parts of transmission system
- Provides strong oil film/good shear stability
- Excellent thermal and oxidation stability
- Excellent parts material compatibility

WIDE RANGE & MULTI-PURPOSE APPLICATIONS

*Please refer to the application table attached.

SUPERIOR PROPERTIES

Continuously Variable Transmission	CFEx
Density, kg/L @15°C	0.8476
Kinematic Viscosity, mm²/s @ 40°C	35.81
Kinematic Viscosity, mm²/s @ 100°C	7.644
Viscosity Index	190
Pour Point °C	-51
Flash Point °C	226
Brookfield Viscosity, cP @ -20°C	1,073
Brookfield Viscosity, cP @ -40°C	8,990

CVT FLUID EXCELLENT (CFEx)

AUTOMAKER	VEHICLE TYPE	SPECIFIED GENUINE ATF
Toyota	Super CVT	CVT Fluid TC
	Super CVT	CVT Fluid FE
Nissan	N-CVT vehicles (RE0F05A) March, Cube	Matic Fluid D**
	Hyper CVT vehicles (RE0F21A) March, Cube	CVT fluid NS-1
	Hyper CVT vehicles (RE0F06A, RE0F06AV)	CVT fluid NS-1
	Extronic CVT vehicles (RE0F08A/09A/10A)	CVT fluid NS-2
	Extronic CVT vehicles Note, Cube	CVT fluid NS-3
Mazda	Demio, Axela (CVT)	Mobile CVT 3320
Subaru	July, 2007 ~ Demio, Axela	Mobile CVTF 3320
	Samber, Justy, Domingo, Rex, Vivio, Pleo, R1	ECVT- Fluid**/I-CVT Fluid
	R2, (ECVT/I-CVT)	
	Stella (I-CVT)	Subaru I-CVT/I-CVT.FG
Suzuki	SCVT vehicles (Cultus Coertible)	SCVT fluid
	Cultus Crescet G (CVT)	Suzuki CVT oil
	Nov, 2006~Wagon R (CVT)	Suzuki CVT fluid green 1/ green 1V
	CVT MR Wagon, Alto, WagonR	Suzuki CVT fluid green 2
	May, 2007~Swift (CVT)	Suzuki CVT fluid 3320
Mitsubishi	Invecs-III CVT	Dia Queen ATF SP III**
	Outlander (CVT)	Dia Queen CVT Fluid-J1
	Mirage, Outlander, RVR, Delica (Mirage)	Dia Queen CVT Fluid-J4
Dahaitsu	Sonica, Mira, Move (CVT from 2006)	Ammix CVT Fluid-DC
Proton	Saga FLX**(Mitsubishi Transmission only)	CVT Fluid Green 1V

** Thereare genuine fluid which are released a convertible fluid for AT and CVT in past, but please use ATF for AT and CVTF for CVT.



AISIN
Premium Performance Engine Oil for Scooter

- PERFORMANCE STANDARD: API SL, SN with JASO MB
- JASO MB : 10W-40, 15W-40
- JASO MB2 : 5W-40, 10W-40

DESCRIPTION
AISIN High Performance Engine oil for Scooter meeting the requirement of current advanced top-tier engine oil grade of API SN and is optimized to provide complete scooter engine oil performance especially for fuel efficiency, reducing friction loss and durability. It has been formulated from Synthetic Technology and meeting JASO MB performance standard.

WIDE RANGE & MULTI-PURPOSE APPLICATIONS
It applies to all gasoline fueled vehicles. High performance cars which equipped with DOHC, EFI and VVT as well as four-stroke gasoline engines in motorcycles and sports vehicle is recommended to use AISIN Scooter Oil.

SUPERIOR PROPERTIES

SAE Viscosity	Fully Synthetic 5W-40	Fully Synthetic 10W-40	Semi Synthetic 15W-40	Semi Synthetic 10W-40
API and JASO Standard	SN / MB	SN / MB	SL / MB	SL / MB
Density, kg/L @15°C	0.852	0.8649	0.871	0.8645
Kinematic Viscosity, mm²/s @ 40°C	92.53	96.68	113.7	103.6
Kinematic Viscosity, mm²/s @ 100°C	15.07	14.6	14.85	14.7
Viscosity Index	172	157	135	156
Pour Point °C	-40	-42	-39	-39
Flash Point °C	216	210	242	234
Package (Liters)	1L	1L	1L	1L

Customer Benefits
- Fuel Economy
- Engine power and maintainability
- Oil drainage interval
- All-temperature wear resistance



AISIN
Premium Quality Motorcycle 4T Engine Oil

- PERFORMANCE STANDARD: API SL, JASO MA / MA2
- JASO MA : 15W-40, 20W-50
- JASO MA2 : 20W-40

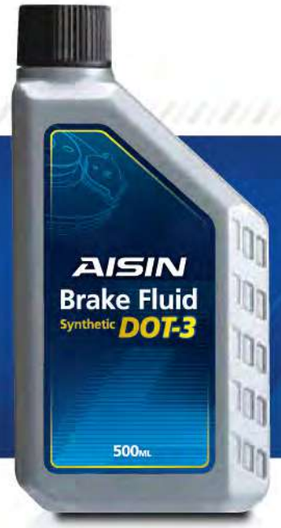
DESCRIPTION
Premium performance, shear-stable, multi-grade gasoline engine oil specifically designed for use in four-stroke motorcycles and portable power equipment requiring API SL JASO MA/MA2 lubricants, including high output engines operating in severe service.

WIDE RANGE & MULTI-PURPOSE APPLICATIONS
AISIN MCO is particularly suitable for Japanese high performance motorcycle engines. It is applicable for motorcycle with and without oil immersed clutches, motorcycle with back torque limiters and exhaust catalytic converters. AISIN 4T MCO is applicable to the latest generation, four-stroke scooter engines and four-stroke gasoline engines fitted to portable power equipment, such as generators, mowers, etc.

SUPERIOR PROPERTIES

SAE Viscosity	15W-40	20W-40	20W-50
JASO Standard	MA	MA2	MA
Density, kg/L @15°C	0.8665	0.8747	0.8742
Kinematic Viscosity, mm²/s @ 40°C	117.2	132.7	158.5
Kinematic Viscosity, mm²/s @ 100°C	14.79	15.02	18.21
Viscosity Index	139	115	128
Pour Point °C	-39	-36	-39
Flash Point °C	216	240	240
Package (Liters)	1L	1L	1L

Customer Benefits
- Prolongs engine life
- Saves on maintenance
- Lively throttle response
- Good all-temperature protection



AISIN
Premium Quality Synthetic Automotive Brake Fluid

- PERFORMANCE STANDARD:
- DOT-3: FMVSS No. 116 DOT 3, SAE J1703, ISO 4925
- DOT-4: FMVSS No. 116 DOT 4, SAE K1704, ISO 4925

**FMVSS – U.S. Federal Motor Vehicle Safety Standard*

DESCRIPTION
Premium, high performance and non-petroleum automotive brake fluid, designed for use in a wide range of conventional hydraulic brake and clutch systems in severe service conditions or where DOT fluids are recommended.

**DOT – Department of Transportation*

SUPERIOR PROPERTIES

FMVSS Grade	DOT-3	DOT-4
Soecific Gravity	1.07	1.1
Equilibrium Reflux Boiling Point, °C	234	258
Wet Equilibrium Reflux Boiling Point, °C	151	163
Kinematic Viscosity, mm²/s @ 40°C	1225	1071
Kinematic Viscosity, mm²/s @ 100°C	2.8	2.1
pH	9.58	8.64
Package (Liters)	0.5L, 200L	0.5L, 200L

Customer Benefits
- Excellent braking response
- Reliable operation in severe service
- Saves on maintenance
- Reduces inventory costs



AISIN
General Purpose Automotive and Industrial Grease (Lithium-EP Type)

- PERFORMANCE STANDARD: NLGI 2 or 3

DESCRIPTION
Smooth, buttery texture, yellowish, translucent, general purpose automotive and industrial grease with adhesive properties manufactured from lithium soap and containing an oxidation inhibitor.

WIDE RANGE & MULTI-PURPOSE APPLICATIONS
Applicable to most of the automotive grease applications including wheel bearings, ball joints, universal joints and linkages. General industrial applications where EP characteristics are not needed. This general purpose grease is applicable for industrial ball and roller bearing, plain bearing and niddle bearing.

SUPERIOR PROPERTIES

NLGI Grade	NLGI 2	NLGI 3
Dropping Point, °C	240	255
Penetration, Worked @ 25°C	272	255
Thickener Type	Lithium	Lithium
Thickener Content, mass%	8.5	10
Water Washout @ 79°C	2.49	0.25
4 Ball EP, kgf	200	200
Life Performance, hrs @ 165°C	80	80
Usable Temperature Range	-30 to 150	-20 to 160
Package (kg)	0.5, 1, 3, 15, 180	0.5, 1, 3, 15, 180

Customer Benefits
- Provides long service life through high oxidation stability
- Resists leakage from bearing through good mechanical stability
- Lubricant effectively in wet conditions due to its resistance to water washout
- Protects bearings from damage under light-load or shock-load conditions.



AISIN
Long Life Coolant / Anti-Freeze JIC

Advanced Formulation for Antirust Agent Environmentally Friendly - Advanced Non-Amine Type

DESCRIPTION
Premium quality, ethylene glycol based antifreeze coolant concentrate, designed primarily to meet the stringent corrosion protection requirements of late model car engines which have a significant amount of aluminum in their construction. With the anti-rust performance, AISIN LLC is suits for the Aluminum Water Pump and to all material used cooling line of engine including Aluminum radiator.

DESCRIPTION
- Please change Long-Life Coolant every 2 years. For vehicles of long distance (truck), it is recommended to change every year.
- Please add distilled or ion-exchanged water only into coolant of 30 ~ 60% (JIS) concentration.
- If concentration is low, it is easy to be frozen and give damage to the radiator, or the anti-rust cannot function well.

REASON OF LLC COOLANT DEGRADATION
Functional decline in high temperature
- There will be decline in function after usage for a long time
- Heat from the engine will decrease the function of anti-foaming, anti-oxidizing, and anti-rust of the coolant

Purity decrease due to rust
- Radiator will rust and be melt into coolant if the radiator is used over a long time
- The coolant will be dirtier as time proceeds and function declines

SUPERIOR PROPERTIES

Long-Life Coolant Concentration	20%	50%	100%
Ethylene glycol, Contents wt (%)	18 - 22	48 - 52	90 - 94
Density, g/cm³ @20°C	1.040	1.080	1.128
Equilibrium Boiling Point, °C	103	110	165
pH, undiluted solution	8.0	8.0	8.3
Flash Point, °C (Cleveland open-cup)	137	None	None
Package (Liters)	1L, 4L	1L, 4L	1L, 4L

Customer Benefits
- Protect cooling systems from corrosion and deposits
- Provides a higher boiling point for protection against engine overheating
- Prevents coolant from freezing
- Long service life
- Maximizes Aluminium engine components life

Frequently Asked Question

Q1. Oil drain interval of engine oils?
A1. Be guided by the engine manufacturer's specifications according to automotive owner's manual or recommendations. They are carefully assess the operating conditions of engine, allowing for peaks in the speed, load and operating temperatures of oil and cooling system.

Q2. What happen if I use low performance oil where higher performance oil is recommended by the engine manufacturer?
A2. Initially, nothing will happen, provided the viscosity grade is correct. However, the oil would soon lose alkalinity (corrosion wear) and thicken due to oxidation. Premature filter blocking could be expected owing to lower dispersancy, and valve train wear may increase due to the lower anti-wear performance of the oil. Piston ring sticking may also occur, oil consumption will increase and, ultimately, engine life will be reduced.

Q3. What happen if I use high performance oil where lower grade oil was being used?
A3. Initially, nothing will happen, provided the viscosity grade is correct. Some heavy contamination of the oil may occur during the first one or two fills. This is because the higher detergency / dispersancy performance will clean out much of the sludge and deposit in the engine which accumulated when using low performance oil. However, the engine will be cleaner inside and stuck piston rings may be freed up.

Q4. Oil colour changed to black?
A4. Don't worry about the engine oil turning black. It will lose its yellow colour within a few hundred kilometre of being put in to the engine. That doesn't mean it's not working. Quite the contrary - it means it is working well. It changes colour as it traps oxidation oil, deposits and the flakes of metal that pop off heavily loaded engine parts.

Q5. Operating Limit of oil?
A5. Lubricant oils must be observed and monitored regularly. Generally you can observe with apparent of oil with colour and odour. There are test items for monitoring, such as viscosity, flash point. If necessary, there is other test items can be added.

Warning Limits for Diesel Engine Oil (SAE 15W-40)

Items	Units	Method	Warning Limit	Remarks
K. Viscocity, @ 100°C	cSt	D 445	< 12, 18 <	Most important item
FLash Point	°C	D 93	< 190	
Insolubles, Pantane	wt%	D 893	1.0 <	
TAN	mgKOH/g	D 2896	> 5	
Water, Distillated	vol%	D 95	0.2 <	
Metal Contents	ppm	ICP	Al : 20 < Cu : 40 < Fe : 100 < Pb : 30 <	
Apparent			No contamination, No gelling substance, etc	

* It should be recognized that these operating limits can serve only as general guidelines.

Q6. Should I use higher viscosity oil for older car?
A6. The gap between engine cylinder liner and piston increases and the use of lower viscosity oil might result in low pressure phenomenon thus the use of higher viscosity oil in older car is possible.

Q7. At low temperature oil becomes murky and when temperature increase oil becomes clear again. Can this oil still be used?

A7. Yes. At lower temperature, paraffin molecules inside the oil approach its pour point and wax is formed.

Q8. Why is there a difference in colour for same product?

A8. This phenomenon might happen due to the change the base oil undergoes but it does not affect the performance of engine oil. Depending on the types of product, additional additives are added or new additives are substituted. In which situation, the product is manufactured according to the required specifications and there should not be any performance problem.

Q9. What problem in case of customer use 10W-30(SN/CF) for CNG or LPG system.

A9. In general it can be used. However, special additives technology was developed for gas engine and we recommend using engine oil specially designed for this type of engine.

Q10. Why the volume of 0W/5W product does naturally reduced more than 10W product?

A10. 0W/5W products are much lighter than 10W product and so has higher volatility. This phenomenon is normal.

Q11. What the purpose is of Viscosity Modifier used in engine oil?

A11. Viscosity modifier is used to enable engine oil to achieve multi-grade level and thus be applied at a wide range of temperature.

Q12. Starburst logo's meaning is Energy Conserving. Why only these 5W-40 and 10W-30 grades can have the "Starburst" logo but not all the grades can have it? Doesn't it mean others engine oil grade wasn't have energy conserving features?

A12. The Starburst logo means that the product has energy conserving features and currently 0W-20, 0W-30, 5W-20, 5W-30 and 10W-30 products are regulated for this feature under API. Viscosity of oil must be low for Energy Conserving effect to take place.

Q13. What is the different between 100% synthetic and fully synthetic?

A13. Both sentences have the same meaning.
- 100% PAO Synthetic is made of 100% PAO
- 100% Synthetic is made of PAO + Gr.III Base Oil

Thus Fully Synthetic means 100% Synthetic.

Q14. How does Liquid Titanium work? Is Liquid Titanium abrasive? Is Liquid Titanium just another "aftermarket additive?" What are the benefits of using Diesel Engine Oil with Liquid Titanium versus conventional Engine oil with API CJ-4 engine oil?

A14. Liquid titanium is an anti-wear component used in engine oil additives. Generally engine oil that satisfies API CJ was developing to offer engine protection and we do not recommend adding liquid titanium as extra additives.

Q15. Retailer commented that some AT transmission needs Automatic Transmission fluid with fully synthetic base. If the transmission using non-synthetic based AT fluids, the transmission will not function properly. Is it true?

A15. Function of ATF is to provide Friction Durability, Torque Capacity, Corrosion Protection, Wear Protection, Anti-Oxidation, Shear Stability and synthetic base oil must be used to offer those performances. Especially in the area of anti-oxidation and shear stability where the role of base oil outweigh the added additives, base oil plays a big role in determining the quality of lubricant products.

AISIN Lubricant Quality Check List / Manual

When any engine oil quality claim happens, it is better to handle the issue immediately at that place for customer satisfaction and cost efficiency. For this reason, please refer to below check lists for your action. (Most of the cause of trouble or reasons can be found in below check lists).

Check List at Shop/Garage

a. Clarify what is the product name (with API/SAE) information?

b. What is the phenomenon?
   - More details phenomenon information is helpful for finding solution. Sometimes, it is not related with engine oil quality

c. General lubricants oil change cycle by the owner for his/her car?

d. Filling Quantity?
   - Less filling, lubricant is not good that it makes noisy and wear. Much filling, oil overflow and made white smoke and bed smell.

e. Flushing of previous engine oil? Condition off previous engine oil?
   - Original oil should be drained 100%.

f. Use of additional engine cleaning booster or not?
   - It can produce chemical reaction in the engine…

g. Recommended Oil API/Grade in vehicle manual?

h. Car Name/Age/Drives mileage?

i. Engine Condition and History of Car maintenance?

When it can't be found the root cause at shop/garage, oil sample analysis could be required.

a. Please check the lot and/or batch number on the product label. Request to our technical team members to perform tests on the same lot number sample which our affiliate factory keeps in the plant. If there is no problem with the holding sample, the product is in normal condition.

b. Please send us the engine oil sample and below product information.
   - Sample size: at least 1 litre
   - Request sample information
     i. Check list information at shop/garage
     ii. Product Lot (Batch)Number
     iii. Local Customer names/Contact Point/Use quantity
     iv. Distributor Name/Contact Person/Contact Point
     v. Date of Request/ Date of Lubricants Change

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