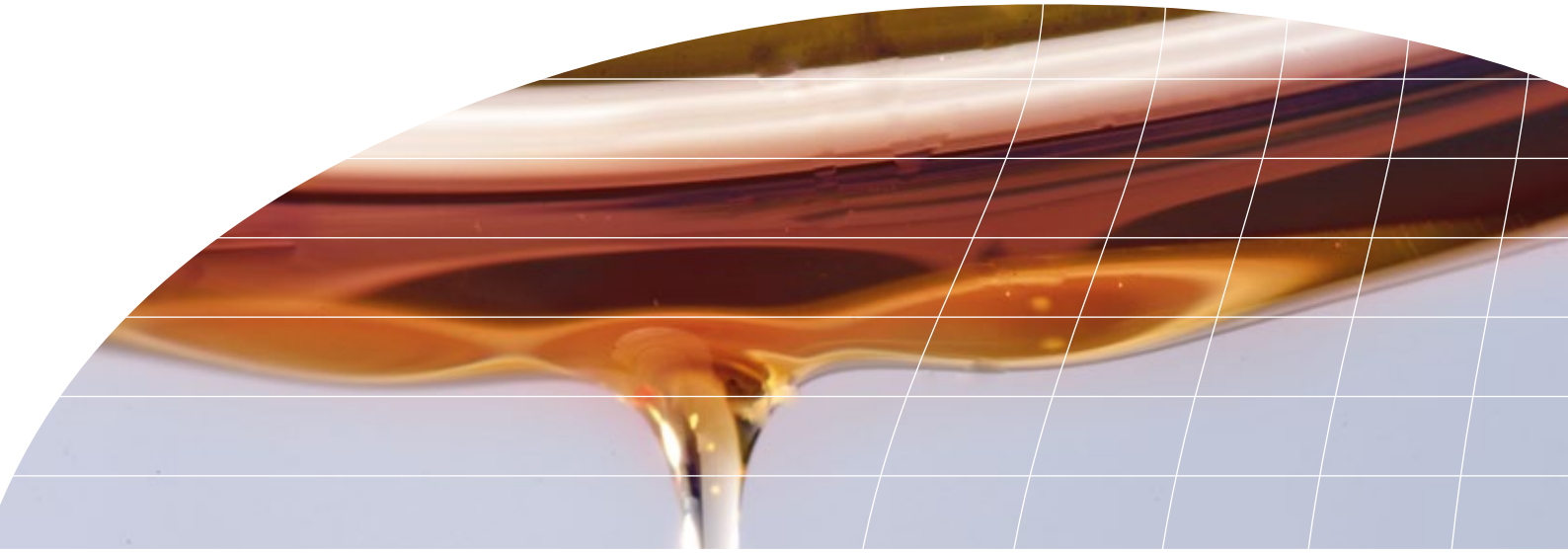


Aviation

Lubricants and Services



TOTAL



TOTAL

Discover our complete range of aviation lubricants and services

PISTON ENGINES LUBRICANTS

	Products	Specifications	Applications	
Non dispersive	Aero 80	<ul style="list-style-type: none"> FRANCE: AIR 3560/D grade SAE 40 * US, UK: SAE J 1966 SAE grade 40 	<ul style="list-style-type: none"> Pure mineral oils for the lubrication of piston engines operating under average conditions. Lubrication of vintage aeroplanes (WWI and WWII warplanes). 	
	Aero 100	<ul style="list-style-type: none"> FRANCE: AIR 3560/D grade SAE 50 * US, UK: SAE J 1966 SAE grade 50 		
	Aero 120	<ul style="list-style-type: none"> US: SAE J 1966 grade SAE 60 		
Dispersive	Aero D 80	<ul style="list-style-type: none"> FRANCE: AIR 3570 grade SAE 40 * US, UK: SAE J 1899 SAE grade 40 	<ul style="list-style-type: none"> Ashless dispersive monograde mineral oils for the lubrication of piston engines operating under severe and very severe conditions. 	
	Aero D 100	<ul style="list-style-type: none"> FRANCE: AIR 3570 grade SAE 50 * US, UK: SAE J 1899 SAE grade 50 		
	Aero D 120	<ul style="list-style-type: none"> FRANCE: AIR 3570 grade SAE 60 * US, UK: SAE J 1899 SAE grade 60 		
	Aero XPD 80	<ul style="list-style-type: none"> FRANCE: AIR 3570 grade SAE 40 * US, UK: SAE J 1899 SAE grade 40 FAA approved AD 80-04-03R2 paragraph b.1. AVCO LYCOMING (310F) and TELEDYNE CONTINENTAL (MHS-24) approved. 	<ul style="list-style-type: none"> New generation ashless dispersive monograde mineral lubricants, specially developed to improve anti-wear and corrosion protection of your highly valued piston aviation engine. 	
	Aero XPD 100	<ul style="list-style-type: none"> FRANCE: AIR 3570 grade SAE 50 * US, UK: SAE J 1899 SAE grade 50 FAA approved AD 80-04-03R2 paragraph b.1. AVCO LYCOMING (310F) and TELEDYNE CONTINENTAL (MHS-24) approved. 		
	Aero XPD 120	<ul style="list-style-type: none"> FRANCE: AIR 3570 grade SAE 60 * US, UK: SAE J 1899 SAE grade 60 FAA approved AD 80-04-03R2 paragraph b.1. AVCO LYCOMING (301F) and TELEDYNE CONTINENTAL (MHS-24) approved. 		
	Aero DM 15W-50	<ul style="list-style-type: none"> French Air Force approved (n°30330 STPA/MA) SAE J 1899 FAA approved AD 80-04-03R2 paragraph b.1. AVCO LYCOMING (310F) and TELEDYNE CONTINENTAL (MHS-24) approved. 		<ul style="list-style-type: none"> Ashless dispersive multigrade oils for the lubrication of piston engines operating under severe and very severe conditions. Can be used throughout the year in any climate. These oils already contain, in the correct proportions, an anti-wear additive the same as TEXTRON Lycoming additive LW 16702: by using TOTAL AERO DM, it is not necessary to add this additive in the oil.
	Aero DM 20W-60	<ul style="list-style-type: none"> SAE J 1899 Meets the requirements of FAA AD 80-04-03R2 paragraph b.1. from FAA Conform to 301F AVCO LYCOMING specification. 		

* performs to

Total Lubrifiants reserves the right to modify the formulation of its products without prior notice in order to improve their performance or comply with changing regulations.

TURBINE ENGINES LUBRICANTS

Products	Specifications	Applications
Aeroturbine 331	<ul style="list-style-type: none"> FRANCE: AIR 3515/B Iss.3 * UK: DEF-STAN 91-99 Iss. 2 * Joint Service Designation: OM-11 NATO code: O-135 Turbomeca approved 	<ul style="list-style-type: none"> Mineral oil for lubrication of aviation turbine engines. Bearings and gearboxes. Synthetic oil (2nd. generation) for lubrication of helicopter turbine (type 5 cSt).
Aeroturbine 921	<ul style="list-style-type: none"> FRANCE: AIR 3512/A Iss. 2* UK: DEF-STAN 91-97 Iss. 1 * Joint Service Designation: OM-71 NATO code: O-138 Turbomeca approved 	
Aeroturbine 540	<ul style="list-style-type: none"> US: MIL-PRF-23699F-STD UK: DEF STAN 91-101 Iss. 2* Joint Service Designation: OX-27 * NATO code: O-156 SAE-AS 5780-SPC Turbomeca and Eurocopter approved 	
Turbonycoil 3516	<ul style="list-style-type: none"> FRANCE: AIR 3516 / A Iss. 2 US: MIL-PRF-6081 D Grade 1010 NATO code: O-133 	<ul style="list-style-type: none"> Mineral based turbine engine oil.
Turbonycoil 600	<ul style="list-style-type: none"> FRANCE: DCSEA 299/A US: MIL-PRF-23699 F-STD UK: DEF STAN 91-101 Iss. 3 Joint Service Designation: OX-27 / OX-28 NATO code: O-156 SAE-AS 5780-SPC 	<ul style="list-style-type: none"> Synthetic lubrication oil for lubrication of gas turbine (type 5 cSt)
Turbonycoil 699	<ul style="list-style-type: none"> UK: DEF STAN 91-100 Iss. 3 Amd.1 Joint Service Designation: OX-26 NATO code: O-160 	<ul style="list-style-type: none"> Synthetic helicopter gearbox, transmission and turbine engine oil.
Turbonycoil 160	<ul style="list-style-type: none"> US: MIL-PRF-7808 L Grade 3 UK: Joint Service Designation: OX-9 NATO Code: O-148 	<ul style="list-style-type: none"> Synthetic turbine engine oil (type 3 cSt).

* performs to

GEAR OILS

Products	Specifications	Applications
Aerogear 823	<ul style="list-style-type: none"> FRANCE: DCSEA 255/A US: MIL-PRF-6086E (medium grade) * UK: DEF STAN 91-112/1 * Joint Service Designation: OEP-70 NATO code: O-155 EUROCOPTER approved 	<ul style="list-style-type: none"> Mineral oil for highly stressed gearboxes such as helicopter gearboxes.
Aerogear 1032	<ul style="list-style-type: none"> AIR 3525/B approved US: MIL-PRF-6086E (medium grade) * UK: DTD 581 C grade OEP-70 Joint Service Designation: OEP-70 NATO code: O-155 EUROCOPTER ECS 2199 approved 	<ul style="list-style-type: none"> Mineral oil for highly stressed gearboxes such as the latest generation of Eurocopter helicopter gearboxes.

* performs to

ENGINES PROTECTION LUBRICANTS

Products	Specifications	Applications
Aeroprotective 219	<ul style="list-style-type: none"> FRANCE: AIR 1503/B type A UK: DEF STAN 91-40/2 * Joint Service Designation: PX-27 NATO code: C-615 	<ul style="list-style-type: none"> Internal protective mineral oil for piston engines.
Nycoprotec 05	<ul style="list-style-type: none"> FRANCE: AIR 1503/B Type B US: MIL-C-6529C Amd. 2 Type 2 NATO code: C-609 	<ul style="list-style-type: none"> Preservative oil for turbine engine and fuel system.

* performs to

HYDRAULIC FLUIDS

Products	Specifications	Applications
Aerohydraulic 520	<ul style="list-style-type: none"> FRANCE: DCSEA 415/A (H-520) US: MIL-PRF-5606H * UK: DEF STAN 91-48/1, standard grade * Joint Service Designation: OM-18 * NATO Code: H-520 	<ul style="list-style-type: none"> Mineral hydraulic oil for systems operating under: <ul style="list-style-type: none"> high pressure, low and extremely low temperatures.
Hydrauncoil FH 51	<ul style="list-style-type: none"> FRANCE: DCSEA 415/A (H-515) US: MIL-PRF-5606H Amd.3 UK: DEF STAN 91-48 Iss. 2* Joint Service Designation: OM-15 NATO Code: H-515 	<ul style="list-style-type: none"> Microfiltered mineral hydraulic fluid operating under: <ul style="list-style-type: none"> high pressure, low and extremely low temperatures.
Hydrauncoil FH 42	<ul style="list-style-type: none"> US: MIL-PRF-87257B NATO Code: H-538 	<ul style="list-style-type: none"> Synthetic fire resistant low temperature hydraulic fluid.
Hydrauncoil FH 2	<ul style="list-style-type: none"> FRANCE: DCSEA 437/B US: MIL-PRF-83282 D Amd. 1 Joint Service Designation: OX-19 NATO Code: H-537 	<ul style="list-style-type: none"> Synthetic microfiltered fire resistant hydraulic fluid.
Hydrauncoil FH 6	<ul style="list-style-type: none"> FRANCE: DCSEA 535/A US: MIL-PRF-6083F UK: DEF STAN 80-142 Iss 2 Amd. 1 * Joint Service Désignation: PX-26 NATO Code: C-635 	<ul style="list-style-type: none"> Mineral based hydraulic fluid preservative grade.
Hydrauncoil FH 5 AW	<ul style="list-style-type: none"> BOEING BMS 3-32 A type II approved 	<ul style="list-style-type: none"> Mineral based hydraulic fluid for aircraft landing gear systems.
Hydrauncoil FH 6 AW	<ul style="list-style-type: none"> BOEING BMS 3-32 A type I approved 	<ul style="list-style-type: none"> Mineral based hydraulic fluid for shock struts on the landing gear systems.

* performs to

GREASES

Products	Specifications	Applications
Aerogrease 5	<ul style="list-style-type: none"> FRANCE: DCSEA 359/A US: MIL-G-3545C Amd. 2 (obsolete) NATO code: G-359 	<ul style="list-style-type: none"> High temperature grease composed of a lithium complex soap in a mineral oil.
Aerogrease 15	<ul style="list-style-type: none"> FRANCE: DCSEA 382/A US: MIL-G-7711 A Amd. 1 (obsolete) * UK: DEF STAN 91-12 * Joint Service Designation: XG-271 NATO code: G-382 	<ul style="list-style-type: none"> Low temperature grease composed of a lithium soap in a mineral oil, when a grease G-359 is not possible.
Nycogrease GN 22	<ul style="list-style-type: none"> FRANCE: DCSEA 395/B US: MIL-PRF-81322G UK: DEF STAN 91-52 Iss. 1 Amd. 2 Joint Service Designation: XG-293 NATO code: G-395 	<ul style="list-style-type: none"> General purpose wide temperature range synthetic based grease.
Nycogrease GN 27	<ul style="list-style-type: none"> US: MIL-G-81827A * 	<ul style="list-style-type: none"> High load capacity wide temperature range synthetic based grease.
Nycogrease GN 10	<ul style="list-style-type: none"> FRANCE: DCSEA 354/A US: MIL-PRF-23827C Amd. 2 UK: DEF STAN 91-53 Iss.3 Amd. 2* Joint Service Designation: XG-287 NATO code: G-354 	<ul style="list-style-type: none"> Advanced synthetic multi purpose aircraft grease.
Nycogrease GN HC	<ul style="list-style-type: none"> FRANCE: DCSEA 363/B US:AMS-G-6032D UK: DEF STAN 91-6 Iss. 4 Joint Service Designation: XG-235 NATO code: G-363 	<ul style="list-style-type: none"> Fuel, solvent and oil resistant synthetic grease designed to lubricate and seal plug valves.
Nycogrease GN GA 47	<ul style="list-style-type: none"> FRANCE: AIR 4247 A Iss.2 US: AMS-2518 A DEF STAN: 80-80 Iss. 2 Joint Service Designation ZX-13 NATO Code: S-720 	<ul style="list-style-type: none"> Graphited anti-seize grease.
Nycogrease GN 17	<ul style="list-style-type: none"> FRANCE: DCSEA 353/A US: MIL-G-21164 D UK: DEF STAN 91-57 Iss. 2 Amd. 1 Joint Service Designation: XG-276 NATO Code: G-353 	<ul style="list-style-type: none"> Synthetic grease with solid lubricant and lithium soap.

* performs to

Total Lubrifiants is non exclusive distributor of NYCO Aviation lubricants and greases :
Turboncoil, Nycoprotec, Hydrauncoil et Nyco grease.



Services

All for a save flight

Oil analyses

ANAC EXPERT is our in depth, personalized diagnosis system for aircraft piston engines. From a sample of oil, you can closely **monitor the natural wear of your engine** and identify the origin of abnormal wear, in order to define actions of preventive maintenance.

The diagnosis report is available within 48 hours after the receipt of the oil sample in the lab.

You benefit from a personalized and safe access to you oil analyses results on the Internet. Through its extensive expertise, TOTAL has built up a large database with reference data of current aircraft piston engines. You can have **confidence in the diagnosis and comments** established by our ANAC technicians.

More information : www.anac-diagnosis.com

ISO 9001:2008

ANAC references : FITG -4 -70

Your references :
Vehicle: Cirrus SR22
Component: Airplane engine

Make and type:
Vehicle: Cirrus SR22
Component: Continental IO-550

Diagnosis date: 10 august 2006
Oil: Total Aero CRM 15V50

	06-APR-06	20-JUN-06	00-AUG-06	08-AUG-06
Sample date				
Sample Number	60004924	60004928	60012441	60012440
Working time	380 H	430 H	460 H	530 H
Mileage oil	49 H	50 H	30 H	50 H
Oil consumption	5 L	3 L	3 L	
Wear				
Iron ppm	87	60	57	62
Copper ppm	9	5	5	5
Tin ppm	4	2	3	2
Chromium ppm	13	8	7	6
Aluminum ppm	12	8	7	6
Nickel ppm	13	7	5	5
Contamination				
Si-Foreign ppm	5	5	4	9
Water %	<0.07	OK	OK	OK
Cooling liq.	OK	OK	OK	OK
Oil				
S.N. mg/KOhg	1.6	0.9	0.2	1.3
A.N. mg/KOhg	-	-	-	-
Visc. 40°C mm2/s	124.1	116.8	113.5	117.6
Visc. 100°C mm2/s	17.2	17.2	17.2	17.0
Visc. Index	152	162	166	158

Interpretation of the diagnosis
* Metals content higher than the standard.
* Monitor the evolution on the next samples.

Aviation fuels

TOTAL is a **major supplier of aviation fuel** : **JET A-1** for turbine engines, **AVGAS 100LL** for piston engines and **AVGAS UL91** for ultra light aircraft with Rotax engines.

It has earned **the trust of its customers all over the world** : airlines, flying clubs, professional and amateur stunt pilots, regardless of the branch of aeronautics involved. Serving 200 international Airports, from Johannesburg to Copenhagen, from Tokyo to Papeete, and more than 500 regional airfields in Europe, somewhere in the world TOTAL aviation crew members refuel an aircraft with **JET A-1**, **AVGAS 100LL** or **AVGAS UL91**, every 30 seconds on average.



4 good reasons to choose TOTAL

A major company

Total Lubrificants is a subsidiary of Total. The Group is the world's fifth largest integrated oil and gas company* and employs nearly 97,000 people on five continents. Total Lubrificants produces and sells its products under the TOTAL brand in more than 160 countries.

Safe and eco-friendly products

Elements designed to reduce the risk of toxicity and VOC emissions and encourage recycling and elimination from the environment are incorporated into the design of every new product. Total Lubrificants renews its ISO 9001 certification every three years, as a guarantee of its long-term commitment.

Material safety data sheets available at www.quickfds.com

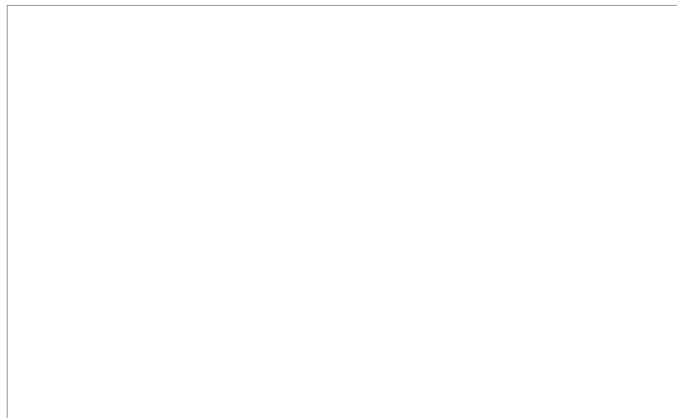
Innovation

Thanks to a major investment in R&D and close cooperation with equipment manufacturers, Total Lubrificants creates high-technology products with substantial added value, for optimal performance and protection of your machinery.

Partnership

The wide range of TOTAL products means that you can find the maintenance lubricants or specialized products to meet your every need. By choosing TOTAL, you can be fully confident that our team will work with you to enhance your productivity and reduce your maintenance costs.

** Based on market capitalization in dollars at 31 December 2008.*



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TOTAL