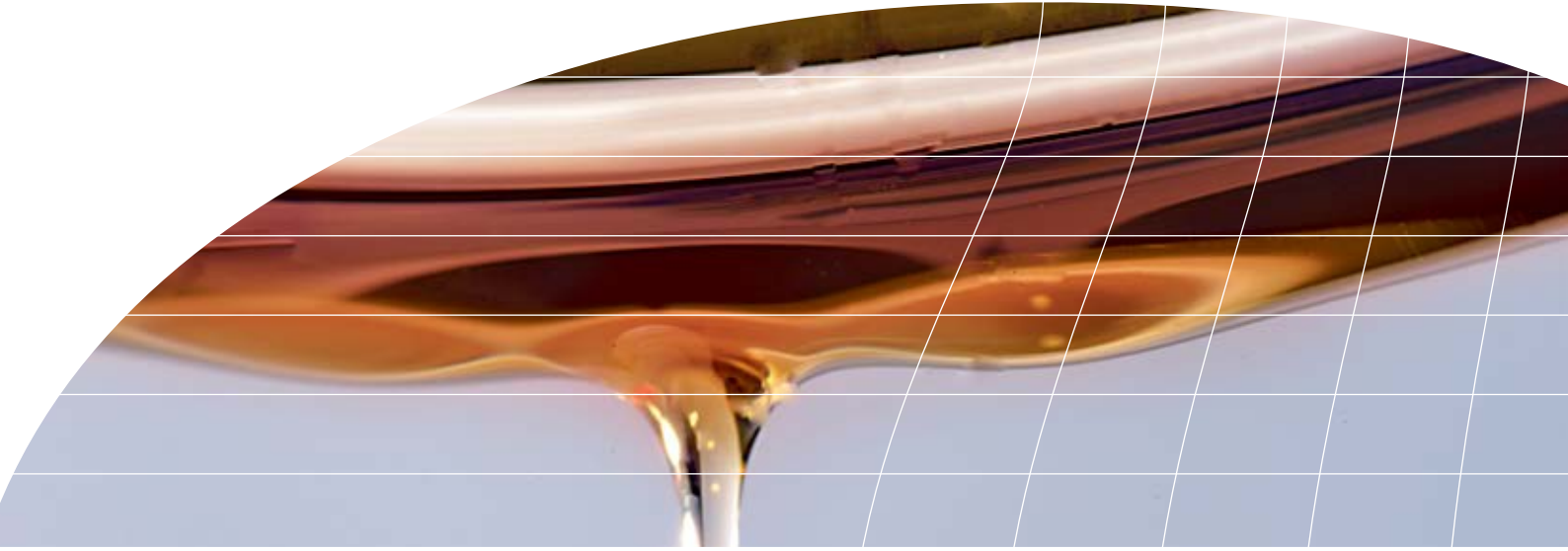


Aviation

Lubricants and Services



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. New generation ashless dispersive monograde mineral lubricants, specially developed to improve anti-wear and corrosion protection of your highly valued piston aviation engine. These oils already contain an anti-wear additive similar to TEXTRON Lycoming LW 16702. 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 an anti-wear additive similar to TEXTRON Lycoming LW 16702.
	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) approved. 	
	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) 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) 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. 	
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

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.
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 	
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 LUBRICANT

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.

* 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.
Hydraunycoil 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.
Hydraunycoil 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.
Hydraunycoil 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.
Hydraunycoil 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.
Hydraunycoil 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.
Hydraunycoil 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 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"> High temperature grease composed of a lithium complex soap in a mineral oil. 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

Services

All for a safe 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 your 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 : FTG—4—70

Your references :
Vehicle: Cirrus SR22
Component: Airplane engine

TOTAL ANAC EXPERT

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

Diagnosis date: 10 august 2006
Oil: Total Aero DM 15V55

	EXPERT 05-APR-06	EXPERT 25-JUN-06	EXPERT 06-AUG-06	EXPERT 08-AUG-06
Sample date	05-APR-06	25-JUN-06	06-AUG-06	08-AUG-06
Sample Number	60004924	60004928	60012441	60012440
Working time	360 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	
Metals				
Iron ppm	87	60	57	62
Copper ppm	9	5	5	5
Tin ppm	4	2	3	2
Chromium ppm	13	8	7	6
Aluminium ppm	12	8	7	6
Nickel ppm	13	7	5	5
Contaminants				
Si Foreign ppm	5	5	4	9
Water %	<0.07	OK	OK	OK
Cooling liq.	OK	OK	OK	OK
Oil				
B.N. mgKOH/g	1.0	0.9	0.2	1.3
A.N. mgKOH/g	-	-	-	-
Visc. 40°C mm2/s	124.1	118.8	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.



5 good reasons for choosing TOTAL

A major player

Total Lubrificants is a subsidiary of Total Group. The Group is the world's fifth largest publicly-traded integrated international oil and gas company* and employs more than 96,000 people on five continents. Total Lubrificants manufactures and sells its lubricants in more than 150 countries.

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.

Quality and environment

Total Lubrificants ISO 9001 certification is the guarantee of a long term commitment to quality. From the initial design stage, our R&D teams seek to develop products with characteristics that minimise toxicity risks and that may be either recycled or disposed of in a manner that creates the least environmental impact.

Local support and responsive logistics

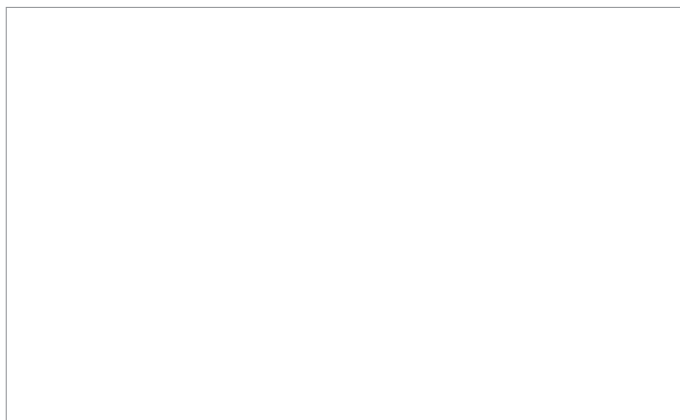
Thanks to our local commercial and technical presence, we can respond to your specific needs. Our integrated organization, including our own production plants and logistics, ensures that we can supply products within the tightest deadlines.

Partnership

We are at your side bringing our expertise to optimize the productivity of your machinery and reduce your maintenance costs. The large variety of our product ranges allows you to cover all your needs for maintenance, specialty lubricants or coolants.

* Based on market capitalization (in dollars) as of December 31, 2012

Material Safety Data Sheets available at www.quickfds.com



<http://www.lubricants.total.com/pro/industry.html>
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