AeroShell Turbine *Oil 500*

Synthetic lubricating oil for aircraft turbine engines

AeroShell Turbine Oil 500 is a 5 mm^2/s synthetic hindered ester oil incorporating a carefully selected and balanced combination of additives to improve thermal and oxidation stability and metal passivation.

DESIGNED TO MEET CHALLENGES

Main Applications

- AeroShell Turbine Oil 500 was developed essentially to meet the requirements of Pratt & Whitney 521 Type II and MIL-L-23699 specifications and is entirely suitable for most civil and military engines requiring this class of lubricant. AeroShell Turbine Oil 500 is approved for use in a wide range of turbine engines as well as the majority of accessories.

  With the advent of the new civil turbine oil specification, SAE AS5780, which has more stringent requirements than the military specification MIL-PRF-23699, AeroShell Turbine Oil 500 was approved as a SPC (Standard Performance Capability) oil.

- AeroShell Turbine Oil 500 contains a synthetic ester oil and should not be used in contact with incompatible seal materials and it also affects some paints and plastics.

Specifications, Approvals & Recommendations

- MIL-PRF-23699G Grade STD
- SAE AS5780D Grade SPC
- DEF STAN 91-101 (British)
- DCSEA 299/A (French) equivalent
- NATO Code O-156
- Joint Service Designation OX-27
- Pratt & Whitney 521C Type II
- General Electric D-50 TF 1
- Allison EMS - 53 (Obsolete)

For the latest approval, please confirm with the equipment manufacturer.

AeroShell Turbine Oil 500 is approved for use in all models of the following engines:

- Engine Alliance: GP7200 series
- GE: CF34, CF6, H series, Catalyst, CF 700, CT7 and CJ series
- Honeywell: T53, AL5512, ALF502, LF507, TPE331, CTS800
- Pratt & Whitney, Canada : JT 15, PT6, PW110, 120, 200, 300, 500 & 600 series
- Pratt & Whitney : JT series, PW 4000, 6000
- Rolls-Royce : Model 250, 501K, AE2100 & 3007 series, BR 710 & 715, RB211-535 & RB211-524 B to E series. Tay, Spey, Tyne, Viper, Adour, Gnome, Gem
- Safran Helicopter Engines: RTM322, Astazou, Arrius
- APU:
- Honeywell: All APUs for 5cSt oils
- Pratt & Whitney : APS Series for 5cSt oils, PW 901, PW980.

  AeroShell Turbine Oil 500 is also approved for use in the industrial and marine versions of the Rolls Royce Avon, Allison 501K and 570K, Honeywell TF35, Pratt & Whitney GG3/FT3, GG4/FT4, GG12/FT12, all General Electric LM Series of units, Turbomeca industrial engines and certain Solar gas turbine engines.

  For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Typical Physical Characteristics

Properties			Method	MIL-PRF-23699G Grade STD	Typical
Oil type				Synthetic ester	Synthetic ester
Kinematic viscosity	@100^{0}C	mm^2/s	ASTM D445	4.90 to 5.40	5.11
Kinematic viscosity	@40^{0}C	mm^2/s	ASTM D445	23.0 min	25.40
Kinematic viscosity	@-40^{0}C	mm^2/s	ASTM D2532	13 000 max	9 215

Properties			Method	MIL-PRF-23699G Grade STD	Typical
Flashpoint (Cleveland Open Cup)		^{o}C	ASTM D92	246 min	264
Pourpoint		^{o}C	ASTM D97	-54 max	<-54
Total Acidity		mgKOH/g	SAE-ARP-5088	1.00 max	0.05
Evaporation loss 6.5 hrs	@204°C	% m	ASTM D972	10 max	2.5
Foaming tendency		ml	ASTM D892	Must pass	Passes
Thermal Stability / Corrosivity 96 hrs - metal weight change		mg/cm^{2}	FED-STD-791 M.3411	±4.0 max	Passes
Thermal Stability / Corrosivity 96 hrs - viscosity change		%	FED-STD-791 M.3411	5.0 max	1.42
Thermal Stability / Corrosivity 96 hrs - Total Acid Number Change		mgKOH/g	FED-STD-791 M.3411	6.0 max	1.9
Swelling of Standard Synthetic Rubber - SAE-AMS 3217/4, 72 hrs	@204°C	swell %	FED-STD-791 M.3604	5 to 25	Within limits 15%
Elastomer compatibility, % weight change after 24/120 hours Fluorocarbon	@200°C		DEF STAN 05-50 M.22	10/15 max	Passes
Elastomer compatibility, % weight change after 24/120 hours LCS Fluorocarbon	@200°C		DEF STAN 05-50 M.22	10/20 max	Passes
Elastomer compatibility, % weight change after 24/120 hours Nitrile	@130°C		DEF STAN 05-50 M.22	19.5/22 max	Passes
Elastomer compatibility, % weight change after 24/120 hours Silicone	@175°C		DEF STAN 05-50 M.22	16.5/16.0 max	Passes
Elastomer compatibility, % weight change after 24/120 hours Perfluoroelastomer	@200°C		DEF STAN 05-50 M.22	N/A	Passes
Ryder Gear Test, Relative Rating Hercolube A		%	FED-STD-791 M.6508	102 min	Passes
Bearing Test Rig Type 1 1/2 conditions - Overall deposit demerit rating	100hrs		FED-STD-791 M.3410	80 max	Passes
Bearing Test Rig Type 1 1/2 conditions - viscosity change	@40°C	%	FED-STD-791 M.3410	-5 to +30	Passes
Bearing Test Rig Type 1 1/2 conditions - Total acid number change		mgKOH/g	FED-STD-791 M.3410	2 max	Passes
Bearing Test Rig Type 1 1/2 conditions - filter deposits		g	FED-STD-791 M.3410	3.0 max	Passes
Trace metal content			ASTM D5185 or D6595	Must pass	Passes
Sediment		mg/l	FED-STD-791 M.3010	Must pass	Passes
Corrosion and Oxidation Stability 72 hrs	@175°C		ASTM D 4636 Alternate Proc.2	Must pass	Passes
Corrosion and Oxidation Stability 72 hrs	@204°C		ASTM D 4636 Alternate Proc.2	Must pass	Passes
Corrosion and Oxidation Stability 72 hrs	@218°C		ASTM D 4636 Alternate Proc.2	Must pass	Passes
HLPS dynamic coking @ 20hrs	@375°C	Deposit mg	SAE ARP5996	4.0 max	1.75 average
Sonic shear stability - Viscosity change	@40°C	%	ASTM D2603	4 max	0.19

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  This product is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on Health and Safety is available on the appropriate Safety Data Sheet, which can be obtained from https://www.epc.shell.com

- **Protect the Environment**

  Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Advice**

  Advice on applications not covered here may be obtained from your Shell representative.