Technical Data Sheet

AeroShell **Turbine** *Oil 560*

Synthetic lubricating oil for aircraft turbine engines

AeroShell Turbine Oil 560 is a third generation, high performance, low coking 5 mm^2/s synthetic hindered ester oil incorporating a carefully selected and finely balanced combination of additives to improve thermal and oxidation stability.

DESIGNED TO MEET CHALLENGES

Main Applications

- Changes which have taken place over the last twenty years in engine performance (in terms of improved fuel consumption, higher operating temperatures and pressures) and maintenance practices have resulted in increased severity in lubricant operating conditions.
- AeroShell Turbine Oil 560 was developed to withstand the hostile environments of today's high powered, high compression engines in which the older generation of oils can be stressed up to and beyond their thermal limits, as evidenced by oil coking in the high temperature bearing areas.
- By overcoming the problems associated with using old technology oils in new technology engines, AeroShell Turbine Oil 560:
- maintains a cleaner engine
- provides improved load carrying capacity
- reduces maintenance costs
- prolongs bearing life in both new and existing engines.
- In order for military authorities to take advantage of this better performance in military engines the specification MIL-PRF-23699 was re-written to include a "High Thermal Stability" (HTS) grade as well as the Standard (STD) and Corrosion Inhibited (C/I) grades. AeroShell Turbine Oil 560 is fully approved as an HTS oil. With the advent of the new civil turbine oil specification, SAE AS5780, which has more stringent requirements than the military specification, AeroShell Turbine Oil 560 was approved as a SPC (Standard Performance Capability) oil.
- With effect from January 1st 2002, AeroShell Turbine Oil 560 has been manufactured with an improved formulation to further enhance its anti-coking performance.
- AeroShell Turbine Oil 560 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 HTS
- SAE AS5780D Grade SPC
- DEF STAN 91-101 (British) equivalent
- COMAC QPL-CMS-OL-202
- DCSEA 299/A (French) equivalent
- VNII NP 50-1-4F, B3V, LZ-240, VNII NP 50-1-4U and 36/Ku-A (Russian) analogue
- NATO Code O-154
- Joint Service Designation OX-27 equivalent
- 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 560 is approved for use in all models of the following engines:

- CFM: CFM56 & LEAP series
- Engine Alliance: GP7200 series
- GE: CF34, CF6, GE90, GEnx, GE9X, Passport, H series, Catalyst, CF 700
- Honeywell: CFE738, ALF502, LF507, TPE331, CTS800
- IAE : V2500 Series
- Pratt & Whitney, Canada: JT15, PT6, PW110, 120, 200, 300 series
- Pratt & Whitney: JT3C, JT8D, JT9D, PW4000, PW6000 and PW2000 (for in-service evaluation)

- Rolls-Royce: Model 250, BR 710, RB211 series, Tay, Spey, Tyne, Avon, RB199

  APU:

- Honeywell: All APUs for 5cSt oils
- Pratt & Whitney: APS Series for 5cSt oils, PW 901, PW980
- Safran Helicopter Engines: MTR390, Astazou, Arrius, Artouste, Astazou, Arrius

  Full details of the approval status of AeroShell Turbine Oil 560 in APUs and other engines/accessories is available.

  AeroShell Turbine Oil 560 is also approved for use in the industrial and marine versions of Pratt & Whitney FT Series engines, all General Electric LM Series Aero Derived Engine and Siemens where Rolls Royce engines are approved.

  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 HTS	Typical
Oil type				Synthetic ester	Synthetic ester
Kinematic viscosity	@100°C	mm^2/s	ASTM D445	4.90 to 5.40	5.21
Kinematic viscosity	@40°C	mm^2/s	ASTM D445	23.0 min	26.7
Kinematic viscosity	@-40°C	mm^2/s	ASTM D2532	13 000 max	10 229
Flash Point (Cleveland Open Cup)		°C	ASTM D92	246 min	268
Pour Point		°C	ASTM D97	-54 max	-60
Total Acidity		mgKOH/g	SAE-ARP-5088	1.00 max	0.20
Evaporation Loss 6.5 hrs	@204°C	% m	ASTM D972	10 max	2.0
Foaming Tendency		ml	ASTM D892	Must pass	Passes
Thermal Stability / Corrosivity 96 hrs - Metal weight change		mg/cm	FED-STD-791 M.3411	±4.0 max	Passes
Thermal Stability / Corrosivity 96 hrs - viscosity change		%	FED-STD-791 M.3411	5.0 max	Passes
Thermal Stability / Corrosivity 96 hrs - Total Acid Number Change		mgKOH/g	FED-STD-791 M.3411	6.0 max	Passes
Corrosion and Oxidation Stability 72 hrs	@204°C		ASTM D4636 - Alternate Proc.2	Must pass	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	200 hrs		FED-STD-791 M.3410	40 max	Passes
Bearing Test Rig Type 1 1/2 conditions - viscosity change	@40°C	%	FED-STD-791 M.3410	0 to 35	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 ½ conditions – Filter Deposits		g	FED-STD-791 M.3410	1.5 max	Passes
Trace metal content			ASTM D5185 or D6595	Must pass	Passes

Properties		Method	MIL-PRF-23699G Grade HTS	Typical
Sediment	mg/l	FED-STD-791 M.3010	Must pass	Passes

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.

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

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

- **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.