

# AEROSHELL TURBINE OIL 560

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

## 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 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. Refer to the General Notes at the front of this section for further information.

## SPECIFICATIONS

<b>U.S.</b>	Approved MIL-PRF-23699F Grade HTS
<b>British</b>	Equivalent DEF STAN 91-101
<b>French</b>	Equivalent DCSEA 299/A
<b>Russian</b>	Analogue to VNII NP 50-1-4F, B3V, LZ-240, VNII NP 50-1-4U and 36/Ku-A
<b>NATO Code</b>	O-154
<b>Joint Service Designation</b>	Equivalent OX-27
<b>Pratt &amp; Whitney</b>	Approved 521C Type II
<b>General Electric</b>	Approved D-50 TF1
<b>Allison</b>	Approved EMS-53 (Obsolete)

## EQUIPMENT MANUFACTURER'S APPROVALS

AeroShell Turbine Oil 560 is approved for use in all models of the following engines:

<b>Honeywell</b>	TFE 731, TPE 331, APUs (majority of models), LTS 101, LTP 101, ALF 502, LF 507, AS907, AS977
<b>Allison (Rolls-Royce)</b>	250 Series
<b>BMW/Rolls-Royce</b>	BR710, BR715
<b>CFM International</b>	CFM-56 (all models)
<b>CFE</b>	CFE 738
<b>GE</b>	GE 90, CF6 (all models), CJ610, CF700, CT58, CF34

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**EQUIPMENT MANUFACTURER'S APPROVALS**

<b>IAE</b>	V2500 Series
<b>IHI</b>	FJR 710
<b>Pratt &amp; Whitney</b>	JT3D, JT8D, JT9D, PW4000 Series (cleared for flight evaluation in PW2000 engines)
<b>Pratt &amp; Whitney Canada</b>	PT6T, PT6A (some models only), PW100 Series, JT15D, PW200 Series, PW300 Series, PW500 Series, PW901A APU
<b>Rolls-Royce</b>	RB211-22B, -524, -535, Spey, Tay, RB183, Adour
<b>Turbomeca</b>	Arriel, Makila, RTM 322, TM 319, TM 333, TP 319, various models of Astazou and Artouste engines

<b>PROPERTIES</b>	<b>MIL-PRF-23699F Grade HTS</b>	<b>TYPICAL</b>
Oil Type	Synthetic ester	Synthetic ester
Kinematic Viscosity @ 100°C @ 40°C @ -40°C	mm <sup>2</sup> /s 4.90 to 5.40 23.0 min 13000 max	5.24 26.71 11000
Flashpoint, Cleveland Open Cup	°C 246 min	268
Pourpoint	°C -54 max	-60
Total Acidity	mgKOH/g 1 max	0.14
Evaporation Loss 6.5 hrs @ 204°C	% m 10.0 max	2.0
Foaming	Must pass	Passes
Swelling of Standard Synthetic Rubber SAE-AMS 3217/1, 72 hrs @ 70°C	swell % 5 to 25	12.9
SAE-AMS 3217/4, 72 hrs @ 204°C	swell % 5 to 25	12.9
standard silicone rubber 90 hrs @ 121°C	5 to 25	8.9
Thermal Stability/Corrosivity 96 hrs @ 274°C		
- metal weight change	mg/cm <sup>2</sup> 4 max	0.23
- viscosity change @ 37.8°C	% 5 max	0.3
- Total Acid Number Change	mgKOH/g 6 max	1.5

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PROPERTIES	MIL-PRF-23699F Grade HTS	TYPICAL
Corrosion & Oxidation Stability 72 hrs @ 175°C 72 hrs @ 204°C 72 hrs @ 218°C	Must pass Must pass Must pass	Passes Passes Passes
Ryder Gear Test, Relative Rating Hercolube A %	102	126
Bearing Test Rig (200 hrs) Type 1½ conditions – Overall deposit demerit rating – viscosity change @ 40°C % – Total Acid Number change mgKOH/g – filter deposits g	35 max 0 to +35 1.5 max 3 max	26 30.8 0.98 0.55
Sonic shear stability – viscosity change @ 40°C %	4 max	NIL
Trace metal content	Must pass	Passes

AeroShell Turbine Oil 560 is also approved for use in the industrial and marine versions of the Rolls-Royce RB211-22, Avon, Spey, Olympus and Tyne engines, Pratt & Whitney GG3/FT3, GG4/FT4, GG12/FT12, GG8/FT8 engines, all General Electric LM Series of units, some Honeywell and Turbomeca industrial engines and certain Solar gas turbine engines.

A viscosity/temperature chart is shown at the end of this section.