Technical Data Sheet

AeroShell**Ascender**

AeroShell Ascender is a “fourth generation” turbine engine oil developed with a high performance, low coking, 5 mm²/s synthetic hindered ester basestock combined with a state of the art additive system, to both improve thermal and oxidation stability and provide superior elastomer compatibility.

DESIGNED TO MEET CHALLENGES

Main Applications

AeroShell Ascender was developed for the latest generation of gas turbine engines as a low-coking, high compatibility product. Its improved thermal and oxidative stability will ensure negligible coke formation in engines, so any traditional engine problems associated with coke should never occur. It has also been tested extensively for elastomer compatibility, which is a known service problem. AeroShell Ascender therefore offers the customer the balance of low coking performance with excellent elastomer compatibility.

AeroShell Ascender will also deliver performance benefits in today’s existing 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.

Performance, Features & Benefits

The value of AeroShell Ascender lies in its ability to deliver both low coking and elastomer compatibility/seal integrity. Until recently, it had been commonly accepted that the two are mutually exclusive, so that improving the oil’s properties in one regard meant compromising the other.

For airline operators, this problem can be expensive in terms of prematurely degraded seals. With AeroShell Ascender, Shell Aviation has developed a product that now deals with this problem so operators no longer have to choose between coking performance and elastomer compatibility.

- **Excellent elastomer seal compatibility**
  Reduced chance of seal swell or degradation leading to high oil consumption and cost of changing the seals
- **Low coking performance**
  Less chance of oil coke build-up in bearing chambers and service pipes resulting in lower maintenance and cleaning costs
- **Improved oxidation and thermal stability**
  Extended oil life during arduous engine conditions
- **Excellent compatibility with other approved oils**
  No issues or concerns when changing from one approved oil to AeroShell Ascender
- **A 'High Performance Capability' grade oil**
  Improved performance over traditional ‘standard’ grade oils can help reduce maintenance costs and extend engine life

Specifications, Approvals & Recommendations

- Approved SAE AS5780B HPC Grade, Approved MIL-PRF-23699F HTS Grade (US)
- Equivalent DEF STAN 91-101 (UK)
- Equivalent DCSEA 299/A (French)
- NATO Code : O-154
- Joint Service Designation : Equivalent OX-27
- Pratt & Whitney : Approved 521C Type II
- General Electric : Approved D-50 TF 1
- IAE : V2500 Series

Typical Physical Characteristics

Properties			SAE AS5780B Grade HPC	Typical
Oil Type			Synthetic ester	Synthetic ester
Kinematic viscosity	@ 100°C	mm²/s	4.90 to 5.40	5.02
Kinematic viscosity	@ 40°C	mm²/s	23.0 min	25.47
Kinematic viscosity	@ -40°C	mm²/s	13000 max	11724

Properties			SAE AS5780B Grade HPC	Typical
Flashpoint		°C	246 min	266
Pourpoint		°C	-54 max	<-54
Total Acidity		mgKOH/g	1 max	0.24
Evaporation loss in 6.5 hrs	@ 204°C	%m	10.0 max	2.0
Foaming			Must pass	Passes
Swelling of standard synthetic rubber, 72 hrs	@ 204°C	swell %	5 to 25	16.24
Elastomer compatibility, % weight change after 24/120 hrs: Fluorocarbon	@ 200°C		11/15 max	9/10
Elastomer compatibility, % weight change after 24/120 hrs: LCS Fluorocarbon	@ 200°C		12/20 max	6.5/8
Elastomer compatibility, % weight change after 24/120 hrs: Nitrile	@ 130°C		Report	8/8
Elastomer compatibility, % weight change after 24/120 hrs: Silicone	@ 175°C		Report	12.5/12.5
Elastomer compatibility, % weight change after 24/120 hrs: Perfluoroelastomer	@ 200°C		Report	0.5/0.5
Thermal stability/corrosivity 96 hrs : Metal weight change	@ 274°C	mg/cm	4 max	0.23
Thermal stability/corrosivity 96 hrs : Viscosity change	@ 37.8°C	%	5 max	0.3
Thermal stability/corrosivity 96 hrs : Total acid number change	@ 274°C	mgKOH/g	6 max	1.5
Corrosion and oxidation stability, 72 hrs	@ 175°C		Must pass	Passes
Corrosion and oxidation stability, 72 hrs	@ 204°C		Must pass	Passes
Corrosion and oxidation stability, 72 hrs	@ 218°C		Must pass	Passes
Ryder gear test, relative rating Hercolube A			102	103
Bearing test rig (200hr test) Type 1 ½ conditions, Overall deposit demerit rating			40 max	33
Bearing test rig (200hr test) Type 1 ½ conditions, Viscosity change	@ 40°C	%	0 to +35	16.7
Bearing test rig (200hr test) Type 1 ½ conditions, Total acid number change		mgKOH/g	2.0 max	0.60
Bearing test rig (200hr test) Type 1 ½ conditions, Filter deposits		g	1.5 max	0.80
HLPS dynamic coking , 20 hrs, Deposit	@ 375°C	mg	0.4 max	0.23
HLPS dynamic coking , 40 hrs, Deposit	@ 375°C	mg	0.6 max	0.32
Shear stability - viscosity change	@ 40°C	%	4 max	Nil
Trace metal content			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**

  AeroShell Ascender 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 Material Safety Data Sheet, which can be obtained from your Shell representative.

- **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.