Technical Data Sheet

AeroShell **Fluid *31***

AeroShell Fluid 31 is a synthetic hydrocarbon based aircraft hydraulic fluid with greatly improved fire resistance characteristics when compared with conventional petroleum products.
AeroShell Fluid 31 has a specially designed base stock which imparts a relatively high flash point, excellent low temperature properties and good oxidation and thermal stability. In addition, AeroShell Fluid 31 is formulated with high technology additives to provide oxidation and corrosion resistance, antiwear, and anti-foaming protection.

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- AeroShell Fluid 31 is superclean filtered to ensure optimum performance in particulate monitored systems.
- AeroShell Fluid 31 is dyed red. The useful operating temperature range is –40 to +205^{0}C.

DESIGNED TO MEET CHALLENGES

Main Applications

- AeroShell Fluid 31 is recommended for use in aircraft, ordnance, and missile systems operating from –40^{0}C to +205^{0}C . This fluid should be considered for use in auto pilots, shock absorbers, brakes, flight control systems, hydraulic servo-controlled systems and other systems using synthetic elastomer seals. An increasing number of aircraft manufacturers now recommend use of this type of fluid in aircraft hydraulic systems in preference to mineral hydraulic oils. This move has been prompted by need to use fluids with better fire resistant properties.
- AeroShell Fluid 31 is also approved for use in the Honeywell (formerly Garrett) cooling turbine (cabin air compressors). Increasingly this type of hydraulic fluid is being adopted for use in hydraulic systems of military aircraft in place of mineral hydraulic fluids.
- AeroShell Fluid 31 is a synthetic hydrocarbon oil and should not be used in contact with incompatible seal materials.
- AeroShell Fluid 31 is compatible with AeroShell Fluids 41, and 61 and can be used in systems designed to operate with MIL-PRF-5606, MIL-PRF-6083, MIL-PRF-87257 and MIL-PRF-46170 fluids.
- Chlorinated solvents should not be used for cleaning hydraulic components which use AeroShell Fluid 31. The residual solvent contaminates the hydraulic fluid and may lead to corrosion.

Specifications, Approvals & Recommendations

- MIL-PRF-83282D
- French: DCSEA 437/A
- NATO Code H-537
- Joint Service Designation OX-19

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

Typical Physical Characteristics

Properties	Method	MIL-PRF-83282D	Typical
Oil type		Synthetic Hydrocarbon	Synthetic Hydrocarbon
Colour			Red

Properties			Method	MIL-PRF-83282D	Typical
Specific Gravity	@15.6/15.6°C		ASTM D1298	Report	0.851
Kinematic Viscosity	@205°C	mm^2/s	ASTM D445	1.0 min	1.06
Kinematic Viscosity	@100°C	mm^2/s	ASTM D445	3.45 min	3.53
Kinematic Viscosity	@40°C	mm^2/s	ASTM D445	14.0 min	14.3
Kinematic Viscosity	@–40°C	mm^2/s	ASTM D445	2 200 max	2 059
Pour Point		°C	ASTM D97	-55 max	-69
Flash Point		°C	ASTM D92	205 min	218
Fire Point (COC)		°C	ASTM D92	245 min	251
Total Acid Number		mgKOH/g	ASTM D664	0.10 max	0.02
Evaporation Loss	@205°C	%m	FED-STD-791 M.350	20 max	10
Low temperature stability 72 hrs	@-40°C		FED-STD-791-3458	Must pass	Passes
Barium content		mg/kg	ASTM D5185	10 max	0
Gravimetric analysis		mg/100ml	ASTM D4898	0.3 max	0.2
Solid Particle Contamination			FED-STD-791 M.3009	Must pass	Passes
Water Content		mg/kg	ASTM D1744	100 max	60
Foaming Characteristics - Seq I Tendency Stability		ml/ml	ASTM D892	65/0	Passes
Flame Propagation		cm/s	ASTM D5306	Must pass	Passes
4-Ball Wear, 75°C - scar dia	1 kg load/1200 rpm	mm	ASTM D4172	0.21 max	0.16
4-Ball Wear, 75°C - scar dia	10 kg load/1200 rpm	mm	ASTM D4172	0.30 max	0.22
4-Ball Wear, 75°C - scar dia	40 kg load/1200 rpm	mm	ASTM D4172	0.65 max	0.51
Corrosion & oxidation stability 168 hrs - metal weight change	@121°C	mg/cm^2	ASTM D4636	Must pass	Passes
Corrosion & oxidation stability (168 hrs @ 121°C) - viscosity change		%	ASTM D4636	10 max	<10
Corrosion & oxidation stability 168 hrs - acid number change	@121°C	mgKOH/g	ASTM D4636	0.2 max	<0.02

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.