Technical Data Sheet

AeroShell **Fluid *51***

AeroShell Fluid 51 is a synthetic hydrocarbon and ester-based fluid for use in hydraulic systems which require reliable operation in extreme low and high temperatures as well as performance outside the capability of traditional MIL-PRF-5606 mineral based fluids. AeroShell Fluid 51 is formulated with high technology additives to provide oxidation and corrosion resistance, anti-wear, and anti-foaming protection. AeroShell Fluid 51 is superclean filtered to ensure optimum performance in particulate monitored systems. AeroShell Fluid 51 is dyed red. The useful operating temperature range is -54°C to +200°C.

DESIGNED TO MEET CHALLENGES

Main Applications

- AeroShell Fluid 51 is recommended for use in aircraft, ordnance and missile systems operating from –54°C to +200°C.
- This fluid should be considered for use in auto pilots, shock absorbers, brakes, flight control systems, hydraulic servo-control systems and other systems using synthetic elastomer seals.
- This fluid is especially recommended for use in high altitude aircraft that normally operate with extended loiter times and high endurance levels such as UAVs and ELINT systems. AeroShell Fluid 51 is a synthetic hydrocarbon oil and should not be used in contact with incompatible seal materials.
- AeroShell Fluid 51 is compatible with the other AeroShell hydraulic fluids and can be used in systems designed to operate with MIL-PRF-5606, MIL-PRF-83282 and MIL-PRF-46170 fluids.
- Chlorinated solvents should not be used for cleaning hydraulic components which use AeroShell Fluid 51. The residual solvent contaminates the hydraulic fluid and may lead to corrosion.

Specifications, Approvals & Recommendations

- MIL-PRF-87257F
- NATO Code H-538
- Joint Service Designation OX-538

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

Typical Physical Characteristics

Properties			Method	MIL-PRF-87257F	Typical
Oil Type				Synthetic hydrocarbon base	Synthetic hydrocarbon / Ester
Kinematic viscosity	@100°C	mm^2/s	ASTM D445	2.0 min	2.1
Kinematic viscosity	@40°C	mm^2/s	ASTM D445	6.7 min	6.8
Kinematic viscosity	@–40°C	mm^2/s	ASTM D445	550 max	461
Flashpoint		°C	ASTM D92	160 min	178
Pour Point		°C	ASTM D97	-60 max	-63
Total acid number		mgKOH/g	ASTM D664	0.20 max	0.09
Evaporation Loss	6.5 hrs @ 135°C	%m	ASTM D972	20 max	9
Water content		ppm	ASTM D6304	100 max	52
Relative density	@15.6/15.6°C		ASTM D4052	Report	0.8420
Colour			ASTM D1500	1.0 max	Pass
Particulate contamination, number of particles per 100 ml in size range		5 to 15 µm	FED-STD-791-3012	8 000 max	1 151

Properties			Method	MIL-PRF-87257F	Typical
Particulate contamination, number of particles per 100 ml in size range		16 to 25 µm	FED-STD-791-3012	1 425 max	62
Particulate contamination, number of particles per 100 ml in size range		26 to 50 µm	FED-STD-791-3012	253 max	22
Particulate contamination, number of particles per 100 ml in size range		51 to 100 µm	FED-STD-791-3012	45 max	8
Particulate contamination, number of particles per 100 ml in size range		over 100 µm	FED-STD-791-3012	8 max	0
Particle Count		Number	SAE AS4059	5	3
Steel on steel wear, scar diam	40 kg	mm	ASTM D4172	0.65 max	0.52
Rubber swell, L rubber 168 hrs	168h @ 70°C	%	ASTM D4289	19.0 to 30.0	Passes
Low temperature stability 72 hrs 72 hrs @ -54°C			FED-STD-791-3458	Must Pass	Passes
Foaming tendency			ASTM D892	Must Pass	Passes
Barium content		mg/kg	ASTM D5185	10 max	<1

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.

- **Protect the Environment**

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

Additional Information

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