Technical Data Sheet

AeroShell **Fluid *41 (NA)***

AeroShell Fluid 41 (NA) is a mineral hydraulic oil manufactured to a very high level of cleanliness, and possesses improved fluid properties. AeroShell Fluid 41 (NA) contains additives which provide excellent low temperature fluidity as well as exceptional anti-wear, oxidation - corrosion inhibition and shear stability. In addition metal de-activators and foam inhibitors are included in this high viscosity index fluid to enhance performance in hydraulic applications. AeroShell Fluid 41 (NA) is capable of wide temperature range operation. AeroShell Fluid 41 (NA) is dyed red.

DESIGNED TO MEET CHALLENGES

Main Applications

AeroShell Fluid 41 (NA) is intended as an hydraulic fluid in all modern aircraft applications requiring a mineral hydraulic fluid. AeroShell Fluid 41 (NA) is particularly recommended where use of a "superclean" fluid can contribute to improvements in component reliability, and can be used in aircraft systems operating unpressurised between –54°C to 90°C and pressurised between –54°C to 135°C.

AeroShell Fluid 41 (NA) should be used in systems with synthetic rubber components and must not be used in systems incorporating natural rubber.

AeroShell Fluid 41 (NA) is compatible with AeroShell Fluids 4, 31, 51, 61 and 71 and SSF/LGF.

Chlorinated solvents should not be used for cleaning hydraulic components which use AeroShell Fluid 41 (NA). The residual solvent contaminates the hydraulic fluid and may lead to corrosion.

Specifications, Approvals & Recommendations

- COMAC Approved to QPL-CMS-OL-104
- Approved MIL-PRF-5606H* (both U.S. and European production)
- Approved DEF STAN 91-48 Grade Superclean* (European production only)

  Meets DEF STAN 91-48 Grade Normal (European production only) Equivalent to DEF STAN 91-48 Grades Superclean* & Normal (U.S. production only)
- Approved DCSEA 415/A (French)
- Analogue to AMG-10 (Russian)
- NATO Code H-515* (equivalent H-520)
- Joint Service Designation OM-15* (equivalent OM-18)

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

Typical Physical Characteristics

Properties			Method	MIL-PRF-5606H	Typical US Production	Typical European Production
Oil Type				Mineral	Mineral	Mineral
Kinematic viscosity	@100°C	mm^2/s		4.90 minimum	6.13	5.30
Kinematic viscosity	@40°C	mm^2/s		13.2 minimum	15.68	14.1
Kinematic viscosity	@–40°C	mm^2/s		600 maximum	384	491
Kinematic viscosity	@–54°C	mm^2/s		2500 maximum	1450	2300
Viscosity index				–	214	Over 200
Flashpoint (Pensky Martin Closed Cup)		°C		82 minimum	104	105
Autoignition temperature		°C		–	230	230
Pour point		°C maximum		–60	–60	–60
Total acid number		mgKOH/g		0.20 maximum	0	0.01
Evaporation loss 6 hrs	@71°C	%m		20 maximum	16.5	10

Properties			Method	MIL-PRF-5606H	Typical US Production	Typical European Production
Water content		ppm		100 maximum	55	<100
Relative density	@15.6/15.6°C			Report	0.874	0.87
Colour				Red	Red	Red
Particulate contamination, number of particles per 100 ml in size range		5 to 15 µm		10000 maximum	1200	808
Particulate contamination, number of particles per 100 ml in size range		15 to 25 µm		1000 maximum	550	116
Particulate contamination, number of particles per 100 ml in size range		25 to 50 µm		150 maximum	70	44
Particulate contamination, number of particles per 100 ml in size range		50 to 100 µm		20 maximum	5	10
Particulate contamination, number of particles per 100 ml in size range		over 100 µm		5 maximum	0	1
Copper corrosion				2e maximum	1b	2b
Steel on steel wear, scar diam		mm		1.0 maximum	0.65	0.95
Rubber swell, L rubber		%		19 to 30	22	25.4
Corrosiveness & oxidation, 168 hrs @135°C - metal weight change				Must Pass	Passes	Passes
Corrosiveness & oxidation, 168 hrs @ 135°C - viscosity change	@40°C	%		–5 to +20	8.08	+0.1
Corrosiveness & oxidation, 168 hrs @135°C - acid number change		mgKOH/g		0.20 maximum	0.02	+0.1
Low temperature stability 72 hrs	@–54°C			Must Pass	Passes	Passes
Shear stability - viscosity change	@40°C			Must Pass	Passes	Passes
Shear stability - acid number change		maximum		0.2	0.2	0.2
Gravimetric filtration		mg/100m		0.3 maximum	0.1	0.3 maximum
filtration time		minutes		15 maximum	10	15 minimum
Foaming tendency				Must Pass	Passes	Passes
Barium content		ppm		10 maximum	Nil	Nil

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**

  Guidance on Health and Safety is available on the appropriate Safety Data Sheet, which can be obtained from http://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.

- ***Superclean grades**

  The British specification DEF STAN 91-48 covers two grades (normal and superclean) of mineral hydraulic fluid which differ only in their cleanliness limits. AeroShell Fluid 41 (NA) is manufactured to meet the superclean requirements and thus it also meets the requirements of the normal grade.