

OTHER AEROSHELL FLUIDS

Other AeroShell Fluids are used for special applications on aircraft, aircraft engines and auxiliary equipment, and can be subdivided under the following headings:

- Lubricating oils
- Gearbox oils
- Calibrating fluids
- De-icing fluids
- Avionic cooling fluids
- Fluids for cleaning, preserving and lubricating

Lubricating Oils

- AeroShell Fluid 1
- AeroShell Fluid 3
- AeroShell Fluid 12
- AeroShell Fluid 18

AeroShell Fluid 1 is an aircraft instrument and light mineral lubricating oil. AeroShell Fluid 3 and AeroShell Fluid 12 cover the two types of aircraft general purpose and instrument oils in use today i.e. mineral oil (MIL-PRF-7870) and synthetic oil (MIL-PRF-6085) respectively. They are recommended for the lubrication of delicate instruments and general aircraft lubrication by oil can application, etc.

AeroShell Fluid 18 is a low temperature, water displacing general purpose oil.

Gearbox Oils

- AeroShell Fluid 5L-A
- AeroShell Fluid 5M-A
- AeroShell Fluid S.8350

AeroShell Fluid 5L-A and 5M-A are recommended for the lubrication of gears where high tooth loadings exist e.g. helicopter gearboxes and constant speed alternator drives. AeroShell Fluid 5L-A is of low viscosity, AeroShell Fluid 5M-A of medium viscosity.

AeroShell Fluid S.8350 is an extreme pressure gear oil and recommended for lubrication of gears where the use of a 90 EP gear oil is required.

Calibrating Fluid

- AeroShell Calibrating Fluid 2

This fluid is used for calibrating the aircraft fuel system components of turbine engines.

De-icing Fluids

- AeroShell Compound 06A
- AeroShell Compound 07

Various alcohols, or mixtures of these with other materials, are used for de-icing windscreens, propellers, carburettors and wing surfaces. The most common requirement, for de-icers for windscreens and propellers, is met by AeroShell Compounds 06A and 07. A mixture of equal volumes of AeroShell Compounds 07 and 06A, is suitable as a defrosting spray for aircraft parked in the open. AeroShell Compound 07 is also an approved wing de-icing fluid.

Avionic Cooling Fluids

- AeroShell Fluid 602

AeroShell Fluid 602 is a cooling fluid for aircraft avionic systems.

Cleaner, Lubricant and Preservative

- AeroShell Fluid 634

AeroShell Fluid 634 combines the three essential functions of cleaning, lubrication and preservation in a single product and although developed for aircraft weapon systems it is now used in an increasing number of other applications.

AEROSHELL FLUID 1

AeroShell Fluid 1 is a light lubricating mineral oil containing, by specification, less than 0.10% mass stearic acid.

APPLICATIONS

For use as a lubricant where a light anti-freezing oil is required, e.g. on aircraft instruments, gun mounting buffers, hydraulic couplings, controls, door hinges, etc. Also used as a preservative oil for Stromberg carburettors and some fuel systems.

AeroShell Turbine Oil 3 can be used as an alternative to AeroShell Fluid 1, but AeroShell Fluid 1 must never be used as an alternative to AeroShell Turbine Oil 3.

SPECIFICATIONS

U.S.	–
British	Approved DEF STAN 91-44
French	Equivalent to AIR 3515/B
Russian	–
NATO Code	O-134
Joint Service Designation	OM-13

PROPERTIES	DEF STAN 91-44	TYPICAL
Oil type	Mineral	Mineral
Kinematic viscosity mm ² /s @ –25°C @ 40°C	1250 max 12 min	1140 12.15
Flashpoint Pensky Martin Closed Cup °C	144 min	150
Pourpoint °C	–45 min	Below –45
Aniline point °C	85 min	87
Aniline point change after extraction with sulphuric acid °C	5.5 max	2.2
Total acidity mgKOH/g	0.3 max	0.15
Ash %m	0.01 max	Less than 0.01
Density @15°C kg/l	–	0.873
Trace element content	Must pass	Passes
Copper corrosion 3 hrs @ 100°C	Must pass	Passes

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

AEROSHELL FLUID 3

AeroShell Fluid 3 is a general purpose mineral lubricating oil recommended for general lubrication of aircraft parts that require a light oil with good low temperature characteristics and a low freezing point. It is inhibited against oxidation and corrosion. AeroShell Fluid 3 is a relatively low viscosity product with good resistance to evaporation.

APPLICATIONS

AeroShell Fluid 3 is recommended for general lubrication of aircraft parts that require a light oil, e.g. hinges, pivot joints, shaft joints, linkage pins and bearings, pulleys, cables, camera mechanisms, radio and radar gear and instruments. AeroShell Fluid 3 is normally applied by means of an oil can or brush. For this reason it is also described as 'an oilcan lubricant'.

Operating temperature range of AeroShell Fluid 3 is -54°C to +121°C.

For high temperature applications where no provision is made for frequent re-lubrication the synthetic oil, AeroShell Fluid 12, should be used in place of the mineral oil, AeroShell Fluid 3; however in this case care should be taken to ensure that there is no incompatibility between AeroShell Fluid 12 and seals, paints etc.

SPECIFICATIONS

U.S.	Approved MIL-PRF-7870C
British	Approved DEF STAN 91-47
French	–
Russian	–
NATO Code	O-142
Joint Service Designation	OM-12

PROPERTIES	MIL-PRF-7870C	TYPICAL
Oil type	–	Mineral
Kinematic viscosity mm ² /s @ 38°C @ -40°C	10 min 4000 max	10.0 Less than 4000
Flashpoint Cleveland Open Cup °C	130 min	155
Pourpoint °C	-57 max	Below -57
Evaporation @ 99°C, 22hrs %m	25 max	13
Total acid number mgKOH/g	–	0.3
Relative Density @ 15.6/15.6°C	–	0.89
Low temperature stability 72 hrs @ -54°C	Must pass	Passes
Oxidation & corrosion stability 168 hrs @ 121°C		
– metal weight change	Must pass	Passes
– viscosity change %	-5 to +20	10
– acid number change mgKOH/g	0.2 max	0.02
Corrosivity	Must pass	Passes
ASTM colour	–	< 0.5

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

AEROSHELL FLUID 5L-A

AeroShell Fluid 5L-A is a highly refined, low viscosity mineral oil containing an extreme pressure additive as well as additives to provide good oxidation and corrosion protection.

AeroShell Fluid 5L-A has good low temperature characteristics.

APPLICATIONS

AeroShell Fluid 5L-A is used for the lubrication of gears where high tooth loadings exist, particularly when operating at low temperature. AeroShell Fluid 5L-A is particularly suitable for the lubrication of radar gearboxes, constant speed alternator drives. AeroShell Fluid 5L-A is also used in those helicopter transmissions (gearboxes) which require use of this type of MIL-PRF-6086 oil.

AeroShell Fluid 5L-A must not be used in engines.

SPECIFICATIONS

U.S.	Approved MIL-PRF-6086E Light Grade
British	Equivalent DEF STAN 91-112 Grade L
French	–
Russian	–
NATO Code	O-153
Joint Service Designation	Equivalent OEP-30

PROPERTIES	MIL-PRF-6086E Light Grade	TYPICAL
Oil type	–	Mineral
Kinematic viscosity mm ² /s @ 37.8°C @ 98.9°C	23 to 34 –	27.8 4.90
Flashpoint Cleveland Open Cup °C	137.8 min	190
Viscosity Index	80 min	100
Pourpoint °C	–40 max	Below –40
Total Acid Number mgKOH/g	1.0 max	0.1
Relative Density @ 15.6/15.6°C	–	0.89
Load Wear Index kg	40 min	45.5
Colour ASTM	8 max	1.0
Foaming, sequence I, II, III	Must pass	Passes
Copper corrosion 3 hrs @ 100°C	Must pass	Passes

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

AEROSHELL FLUID 5M-A

AeroShell Fluid 5M-A is a highly refined, medium viscosity mineral oil containing an extreme pressure additive as well as additives to provide good oxidation and corrosion protection.

APPLICATIONS

AeroShell Fluid 5M-A is used for the lubrication of gears where high tooth loadings exist. AeroShell Fluid 5M-A is particularly recommended for the lubrication of translation units of contra-rotating propellers, radar gearboxes, constant speed alternator drives. AeroShell Fluid 5M-A is also used in those helicopter transmissions (gearboxes) which require use of a MIL-PRF-6086 oil.

AeroShell Fluid 5M-A is also suitable as an extreme pressure lubricant for heavily loaded pins, bushes and gear mechanisms.

AeroShell Fluid 5M-A must not be used in engines.

SPECIFICATIONS

U.S.	Approved MIL-PRF-6086E Medium Grade
British	Approved DEF STAN 91-112 Grade M
French	Equivalent to DCSEA 255/A
Russian	–
NATO Code	O-155
Joint Service Designation	OEP-70

PROPERTIES	MIL-PRF-6086E Medium Grade	TYPICAL
Oil type	–	Mineral
Kinematic viscosity mm ² /s @ 37.8°C @ 98.9°C	60 to 82 –	68 8.3
Flashpoint Cleveland Open Cup °C	154.5 min	204
Viscosity Index	80 min	100
Pourpoint °C	–29 max	Below –29
Total Acid Number mgKOH/g	1.0 max	0.1
Relative Density @ 15.6/15.6°C	–	0.92
Load Wear Index kg	40 min	50
Colour ASTM	8 max	< 3
Foaming, sequence I, II, III	Must pass	Passes
Copper corrosion 3 hrs @ 100°C	Must pass	Passes

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

AEROSHELL FLUID 12

AeroShell Fluid 12 is a low volatility synthetic ester oil used in aircraft instruments and also for the general lubrication of aircraft. It is oxidation and corrosion inhibited, and possesses good high and low temperature characteristics.

APPLICATIONS

AeroShell Fluid 12 is used for general aircraft lubrication as well as for aircraft gyro instrument gimbal bearings, separately lubricated high speed turbines and compressors, aircraft air cycle equipment and electronic equipment. AeroShell Fluid 12 is particularly suitable for use when an oil with a low evaporation rate is required at high and low temperatures.

AeroShell Fluid 12 is a synthetic oil and it should not be used in contact with incompatible seal materials such as neoprene or natural rubber. Suitable seal material include Fluorocarbon (Viton). AeroShell Fluid 12 may also affect certain paints and plastics. It is recommended that components are evaluated for compatibility if there is any question.

SPECIFICATIONS

U.S.	Approved MIL-PRF-6085D
British	Equivalent DEF STAN 91-49
French	Equivalent AIR 3511/A
Russian	–
NATO Code	O-147
Joint Service Designation	Equivalent OX-14

PROPERTIES	MIL-PRF-6085D	TYPICAL
Oil type	–	Synthetic ester
Kinematic viscosity mm ² /s @ 54.4°C @ –53.9°C	8 min 12000 max	8.2 11000
Flashpoint Cleveland Open Cup °C	185 min	220
Pourpoint °C	–57 max	Below –60
Total Acid Number mgKOH/g	–	0.20
Relative Density at 15.6/15.6°C	–	0.925
Evaporation loss in 22 hrs at 120°C % m	1.80 max	1.50
Colour ASTM	–	< 0.5
Oxidation and corrosion stability 168 hrs @ 135°C		
– metal weight change	Must pass	Passes
– viscosity change @ 54.5°C	± 5	0.5
– total acid number change mgKOH/g	0.5 max	0.1
– insolubles mg/100ml	–	1.0
Low temperature stability	Must pass	Passes
Corrosivity	Must pass	Passes

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

AEROSHELL FLUID 18

AeroShell Fluid 18 is a highly refined petroleum lubricating oil and contains additives to inhibit corrosion and rusting and improve water displacing characteristics.

APPLICATIONS

AeroShell Fluid 18 is for use in the lubrication and corrosion protection of small arms and automatic weapons and as a general purpose lubricant for all applications where water displacing, corrosion protection, and low temperature lubrication is required.

AeroShell Fluid 18 is also intended for locks, hinges, electric motors, fans, small bearings, control rods and cables and can be used in numerous non-aviation applications.

AeroShell Fluid 18 is not recommended as a lubricant at temperatures below -57°C.

SPECIFICATIONS

U.S.	Approved MIL-PRF-32033
British	Equivalent DEF STAN 91-79 (obs)
French	–
Russian	–
NATO Code	O-190 (obs)
Joint Service Designation	OX-18 (obs)

PROPERTIES	MIL-PRF-32033	TYPICAL
Oil type	Mineral	Mineral
Kinematic viscosity mm ² /s @ 40°C @ -40°C @ -54°C	11 min 7000 max 60000 max	11.3 4500 55700
Flashpoint Cleveland Open Cup °C	135 min	150
Pourpoint °C	-57 max	-61
Total Acid Number mgKOH/g	–	0.44
Relative Density @ 15.6/15.6°C	–	0.890
Evaporation 22 hrs at 100°C %	25 max	23
Precipitation number ml	0.005 max	0.00
Oxidation and corrosion stability 168 hrs @ 121°C – viscosity change % – change in acidity mgKOH/g – metal weight change	–5 to +20 0.2 max Must pass	10.25 0.01 Passes
Water displacing properties	Must pass	Passes
Copper corrosion 3 hrs @ 100°C	Must pass	Passes
Galvanic corrosion	None	Passes
Rust protection 168 hrs @ 43°C	No rust	Passes

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

AEROSHELL FLUID 602

AeroShell Fluid 602 synthetic base fluid is composed of highly branched, compact and very stable molecules known as polyalphaolefins (PAO), blended with additives to provide long term storage stability.

AeroShell Fluid 602 offers exceptional performance over a wide temperature range and does not react with water, resulting in clean systems and long fluid and component life.

APPLICATIONS

AeroShell Fluid 602 is most widely used as a cooling fluid for aircraft avionic systems, whose benefits include lower initial cost, longer fluid life, lower weight and lower toxicity when compared with other types of avionic system coolants. Since AeroShell Fluid 602 does not react with water, no reclamation equipment is required, adding further to the cost advantage.

SPECIFICATIONS

U.S.	Approved MIL-PRF-87252C
British	–
French	–
Russian	–
NATO Code	S-1748
Joint Service Designation	–

PROPERTIES	MIL-PRF-87252C	TYPICAL
Relative Density at 15.6/15.6°C	–	0.799
Viscosity mm^2/s @ 100°C @ 40°C @ –40°C @ –54°C	1.65 min 5.0 min 300 max 1300 max	1.77 5.29 280 1094
Viscosity Index	–	145
Pourpoint °C	–	–73
Flash point °C	150 min	160
Fire point °C	160 min	171
Evaporation Loss at 204°C, 6.5 hr %m	–	17
Total Acid Number mgKOH/g	0.2 max	< 0.01
Water content, Karl Fischer ppm	50 max	35
Density g/cc Dilatometer @ 0°C @ 100°C @ 190°C	– – –	0.8058 0.7392 0.6768
Specific Heat $\text{cal/g}^\circ\text{C}$ @ –17.8°C @ 37.8°C @ 149°C @ 260°C	– – – –	0.49 0.54 0.63 0.72

Table continued

Table continued

PROPERTIES	MIL-PRF-87252C	TYPICAL
Thermal Conductivity, heat probe method, cal/hr cm ² (°C/cm)		
@ -17.8°C	-	1.26
@ 37.8°C	-	1.21
@ 149°C	-	1.12
@ 260°C	-	1.02
Coefficient of Thermal Expansion Dilatometer 1/°C		
0 to 50°C	-	0.00083
50 to 100°C	-	0.00092
100 to 150°C	-	0.00103
150 to 190°C	-	0.00117
Dielectric Constant 400 Hz	-	2.10
Power Factor 400 Hz	-	< 0.0001
Dielectric breakdown Voltage, Kv	35 min	47
Volume Resistivity @ 25°C ohm-cm	1.0 x 10 ¹⁰ min	2.9 x 10 ¹⁵
Particle Count, Automatic		
5 to 15µm	10000 max	2664
16 to 25µm	1000 max	345
26 to 50µm	150 max	86
51 to 100µm	20 max	10
< 100µm	5 max	0
Elastomer Compatibility Recommended (Swell <5%)	-	Nitrile (N674-70) Fluorosilicone Fluorocarbon Polyacrylate
Marginal (Swell <15%)	-	Nitrile (N497-70)
Not recommended (Swell >15%)	-	Ethylene Propylene Buna N SBR

AEROSHELL FLUID 634

AeroShell Fluid 634 is a highly penetrating, mobile liquid lubricant which combines three essential functions in a single product: cleaning, lubrication and preservation of hand held weapons and weapons systems of both large and small calibre.

APPLICATIONS

AeroShell Fluid 634 is formulated to meet the complete requirements of cleaning, lubricating, and preserving both small and large calibre weapons in virtually all climatic conditions from -54° to +65°C. In addition AeroShell Fluid 634 contains no ozone depleting compounds. AeroShell Fluid 634 can be used in place of the following specifications: MIL-C-372, VV-L-800C, MIL-PRF-3150, MIL-PRF-14107 and MIL-L-46000.

Cleaning

AeroShell Fluid 634 provides additives which in addition to their ability to penetrate between metal surfaces, aid in the effective removal of built up dirt, corrosion particles and firing residues which can be abrasive to both recoil and gas operated mechanisms.

Preservation

After cleaning, a thin-film layer of preservative forms immediately on the surfaces which not only displaces water but provides a corrosion resistant barrier against rust and dirt.

Lubrication

AeroShell Fluid 634 incorporates advanced technology additives to enhance film strength and anti-wear properties, thereby reducing friction between moving parts and minimising wear and the build-up of wear related debris.

AeroShell Fluid 634 is not limited only to ordnance use, in fact, it has been proven effective in a wide variety of applications including automotive, aviation, marine, and general plant maintenance of industrial equipment.

Equipment manufacturers will have their own policy regarding cleaning and preservation which will take account of equipment design, climatic conditions, length of storage, etc. It is therefore important to follow their recommendations.

SPECIFICATIONS

U.S.	Approved MIL-PRF-63460D
British	–
French	–
Russian	–
NATO Code	S-758
Joint Service Designation	–

NOTES

PROPERTIES	MIL-PRF-63460D	TYPICAL
Oil type	–	Synthetic
Viscosity @ 40°C @ -54°C	mm ² /s 9.0 min 3700 max	9.64 3630
Pourpoint	°C -59 max	Below -65
Flash point COC	°C 65.5 min	100
Shell 4 ball wear @ 40 kg 1200 rpm 75°C, 1 hr, scar diameter	mm 0.8 max	0.40 mm
Relative Density @ 15.6/15.6°C	–	0.87
Firing residue removal	% 80 min	85
Salt spray corrosion resistance	Must pass	Passes
Humidity cabinet rust resistance 49°C, 100% rel. Humidity, 900 hrs	Must pass	Passes
Water displacement and stability	Must pass	Passes
Metal corrosion tests, wt change mg/cm ² , 168 hrs @ 55°C		
Zinc	1.5 max	+ 0.00
Aluminium	0.2 max	+ 0.02
Brass	1.0 max	+ 0.07
Steel	0.2 max	+ 0.03
Copper	1.5 max	+ 0.01
Magnesium	0.5 max	+ 0.01
Cadmium	1.5 max	+ 0.02
Low temperature residue and fluidity	Must pass	Passes
Falex load carrying capacity, 750 lb jaw load	750 lbs min	Passes

AEROSHELL FLUID S.8350

AeroShell Fluid S.8350 is an SAE 90 extreme pressure gearbox oil.

APPLICATIONS

AeroShell Fluid S.8350 is used for helicopter rotor gears, drive-shafts and pitch control mechanisms and wherever high loads and slow speeds in gears require the use of a 90 EP gear oil. AeroShell Fluid S.8350 is approved for use in various Westland helicopter gearboxes.

AeroShell Fluid S.8350 must not be used in engines.

SPECIFICATIONS

U.S.	–
British	Approved DTD.900/4981A
French	–
Russian	–
NATO Code	–
Joint Service Designation	OEP-215

PROPERTIES	DTD.900/4981A	TYPICAL
Oil type	–	Mineral
Kinematic viscosity mm ² /s @ 40°C @ 100°C	– 16.26 to 17.42	182 17.0
Viscosity Index	85 min	97
Flashpoint Cleveland Open Cup °C	177 min	228
Pourpoint °C	–18 max	–21
Total Acid Number mgKOH/g	0.2	0.15
Density at 15°C kg/l	–	0.895
Evaporation loss @ 150°C	5 max	3.0
Precipitation number ml	0.05 max	0.01
Copper corrosion	Must pass	Passes
Foaming, sequence I, II, III	Must pass	Passes

AEROSHELL CALIBRATING FLUID 2

AeroShell Calibrating Fluid 2 is composed of Specially Run Stoddard Solvent and is used for calibrating aircraft fuel system components.

APPLICATIONS

AeroShell Calibrating Fluid 2 is intended for the calibration of fuel system components of aircraft turbine engines.

SPECIFICATIONS

U.S.	Approved MIL-PRF-7024E Type II
British	–
French	–
Russian	–
NATO Code	–
Joint Service Designation	–

PROPERTIES	MIL-PRF-7024E Type II	TYPICAL
Oil type	–	Mineral
Relative density @ 15.6/15.6 °C	0.77 ± 0.005	0.77
Temperature – density variation @ 15°C	–	0.7705
@ 30°C	–	0.759
@ 40°C	–	0.752
@ 80°C	–	0.7225
Kinematic viscosity mm ² /s @ 10°C	–	1.46
@ 25°C	1.17 ± 0.05	1.15
@ 40°C	–	0.95
Flashpoint by TAG method °C	38 min	43
Distillation:		
IBP °C	149 min	158
End point °C	210 max	196
Recovery %	98.5 min	98.5
Total Acid Number mgKOH/g	0.015 max	0.007
Colour, Saybolt	–	30
Copper corrosion 3 hrs @ 100°C	Must pass	Passes
Aromatics % vol	20 max	< 1.0

AEROSHELL COMPOUND 06A

AeroShell Compound 06A is used as a de-icing fluid for windscreens, carburettors and propellers.

APPLICATIONS

AeroShell Compound 06A and ethyl alcohol (obsolete grade AeroShell Compound 06) are equally effective for de-icing and are miscible in all proportions. However, operators should follow the aircraft manufacturer's recommendations regarding the type of fluid to be used, because of possible side effects.

SPECIFICATIONS

U.S.	Equivalent TT-I-735a Grade B Equivalent ASTM D770
British	Approved BS.1595
French	Equivalent AIR 3660/B
Russian	–
NATO Code	S-737
Joint Service Designation	AL-11

PROPERTIES		BS.1595	TYPICAL
Flashpoint (Abel)	°C	–	10.0
Distillation Range:			
IBP	°C	81.5	82
Dry		83.0	83
Water content	%m	0.5 max	0.085
Density @ 20°C	kg/l	0.785 to 0.787	0.786
Miscibility with water		Must pass	Passes
Colour	Hazen units	15 max	5
Residue on evaporation	%	0.002 max	0.0002
Aldehydes & Ketones % mass as acetone		0.01 max	0.007
Alkalinity or acidity, % mass as acetic acid		0.002 max	0.0002

AEROSHELL COMPOUND 07

AeroShell Compound 07 is a de-icing fluid composed of ethylene glycol, isopropyl alcohol and distilled water.

Specification DTD.406B requires the product to have the following approximate composition:

Ethenediol (BS.2537) 85% volume

Isopropanol (BS.1595) 5% volume

Distilled water 10% volume

APPLICATIONS

AeroShell Compound 07 is used for in-flight de-icing of windscreens, propellers, wings, tailplanes, etc. on suitably equipped aircraft.

AeroShell Compound 07 is also recommended for removing hoar frost and light snow/ice from parked aircraft. AeroShell Compound 07 can be sprayed undiluted or mixed with up to 50% volume of water, depending upon the severity of the icing conditions, the efficiency of the spraying technique and whether it is applied hot or cold.

SPECIFICATIONS

U.S.	–
British	Approved DTD.406B
French	–
Russian	–
NATO Code	S-745
Joint Service Designation	AL-5

PROPERTIES	DTD.406B	TYPICAL
Flashpoint, Cleveland Open Cup °C	–	54.4
Kinematic viscosity @ 20°C mm ² /s	11.0 to 13.0	11.4
Cold Test @ –40°C	No Deposition	Complies
pH value	6.0 to 7.5	6.9
Conductivity, micromho/cm	5.0 max	0.5
Density @ 15°C kg/l	1.092 to 1.097	1.094
Miscibility with water @ 15°C	Must pass	Passes

TYPICAL TEMPERATURE/VISCOSITY CURVE OF OTHER AEROSHELL FLUIDS

NOTES

