



# AeroShell Turbine Oil 3SP

AeroShell Turbine Oil 3SP is a 3 mm<sup>2</sup>/s mineral turbine oil incorporating additives to improve anti-wear and anti-oxidant properties as well as low temperature properties.

## DESIGNED TO MEET CHALLENGES

### Main Applications

- AeroShell Turbine Oil 3SP has excellent low temperature properties and is approved for use in Russian engines which use the Russian grades MS-8P, MK-8P and MS-8RK. Typical civil applications include various models of the Il-62, Il-76, Il-86, Il-114, Tu-134, Tu-154, YAK-40, AN-12, AN-26, AN-30, and M-15 aircraft as well as the Mi-6 and Mi-10 helicopters. Typical military applications include the MiG-9, MiG-11, MiG-15, MiG-17, MiG-21, Su-7, Su-9, Su-11 and Su-15 aircraft.
- AeroShell Turbine Oil 3SP is approved for use in the preservation of oil and fuel systems where Russian grades MK-8, MS-8P and MS-8RK are used.
- AeroShell Turbine Oil 3SP can also be used in oil mixtures where this oil is mixed with piston engine oil. Typical mixtures are:
  - SM-4.5:
    - = 75% MS-8P + 25% MS-20
    - = 75% AeroShell Turbine Oil 3SP + 25% AeroShell Oil 100
  - SM-8.0:
    - = 50% MS-8P + 50% MS-20
    - = 50% AeroShell Turbine Oil 3SP + 50% AeroShell Oil 100
  - SM-11.5:
    - = 25% MS-8P + 75% MS-20
    - = 25% AeroShell Turbine Oil 3SP + 75% AeroShell Oil 100

Typical applications for these mixtures include the Il-8, AN-12, AN-24, AN-26, AN-28 and AN-30 aircraft as well as various military aircraft and some helicopter transmissions.

### Specifications, Approvals & Recommendations

- (Tested and approved by the Central Institute of Aviation Motors (CIAM) in Moscow):
  - MS-8P (OST 38.01163-78)
  - MS-8RK (TU 38-1011181-88)
  - MK-8 (GOST 6457-66)
  - MS-8P
  - MS-8R
- AeroShell Turbine Oil 3SP is also approved and ratified in Decision No DB - 6.8 - 21 by:
  - GUAP Goscomoboronprom (Chief Department of Aviation Industry of Defence Industry State Committee of Russian Federation)
  - DVT MT (Aviation Transport Department of Ministry of Transport of Russian Federation).

For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk, or the OEM Approvals website.

### Typical Physical Characteristics

Properties			OST 38.01163-78	Typical
Oil type			Mineral	Mineral
Density	@20°C	kg/l	0.875	0.875
Kinematic viscosity	@50°C	mm <sup>2</sup> /s	8.0 min	8.15
Kinematic viscosity	@-40°C	mm <sup>2</sup> /s	4000 max	3367
Pourpoint		°C	-55 max	Below -55
Total Acid Number		mgKOH/g	0.30 max	0.02
Lubricating Properties			Must pass	Passes
Thermal Oxidation			Must pass	Passes

Properties	OST 38.01163-78	Typical
Water Content	Nil	Nil
Sediment Content	Nil	Nil
Sulphur Content % m	0.55 max	0.13
Ash Content % m	0.008 max	0.002
Flashpoint °C	150 min*	Above 140*
Foaming tendency	Must pass	Passes
Corrosivity	Must pass	Passes
Elastomer Compatibility	Must pass	Passes

\* CIAM ACCEPTS LIMIT OF 140°C. REFER TO LETTER OF APPROVAL FOR DETAILS OF WAIVER.

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 Material 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

### ■ COMPARISON OF AEROSHELL TURBINE OIL 3SP and RUSSIAN GRADE MS-8P

In their qualification approval testing programme, CIAM tested AeroShell Turbine Oil 3SP against the requirements of the OST 38.01163-78 Specification and in comparison with a sample of Russian-produced MS-8P. When comparing results, it is important to realise that the OST 38.01163-78 specification was written specifically to cover MS-8P which was made from a particular mineral base oil; a direct analogue of this base oil is not available outside of Russia and so it is to be expected that not all the properties of AeroShell Turbine Oil 3SP would necessarily be identical to those of MS-8P, nor even fully conform to the OST 38.01163-78 specification. This was, indeed, found to be the case by CIAM. Nevertheless, CIAM still approved AeroShell Turbine Oil 3SP as being a suitable alternative to MS-8P.

In terms of volatility - flash point and evaporation loss - AeroShell Turbine Oil 3SP does not conform to the requirements of OST 38.01163-78. However, CIAM proceeded to approve AeroShell Turbine Oil 3SP on the basis that aircraft which use it would formerly have used MK-8P, which was more volatile than the MS-8P which replaced it. CIAM confirmed its acceptance of a lower flash point in their letter dated 24th February, 1994.

With regard to load carrying/anti-wear properties, when assessed by the 4-ball machine, AeroShell Turbine Oil 3SP was found to give marginally inferior results to MS-8P. However, when subjected by CIAM to more realistic, high temperature, SH-3 gearbox bench testing, the results were good and CIAM concluded in their report that all aspects of pinion teeth wear did not exceed the accepted norms and that operation of the gearbox was "normal". Furthermore, deterioration of the oil after test was minimal. Although each batch of AeroShell Turbine Oil 3SP manufactured by Shell is tested on a 4-ball machine, the test methods used are ASTM D2596 and/or D4172 which would not necessarily produce identical results to the Russian GOST 9490-75 method.

### ■ Advice

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