

AeroShell Oil W 15W-50 Multigrade Oil

AVIATION OIL

FOR SPARK IGNITION
PISTON ENGINES

"The Best
Performing
Multi-grade
in General
Aviation."

AeroShell's High Performance Multi-grade 15W-50

AeroShell Oil W 15W-50 is Shell's premium piston engine oil. Being a multi-grade it is designed to be used in any climate, year round, unlike the more commonly used single grade oils.

AeroShell Oil W 15W-50 has been used by aviators for over 15 years and has the most in-service experience of any semi-synthetic multi-grade.

Why buy AeroShell Oil W 15W-50?

The benefits for you:

- Protects your engine faster after cold start-up than any other piston engine oil.
- Best low temperature performance of any aviation piston engine oil. This is especially important in winter conditions.
- Reduces Fuel Consumption by up to 5%.
- AeroShell uses carefully blended base oils, which give proven load carrying performance whilst preventing sludging.
- Takes advantage of modern synthetic oil technology.
- Advanced anti-wear and anti-rust additive package.
- Most in-service experience of any semi-synthetic multi-grade.
- Compatible with AeroShell W100+.
- Superior to all mineral multigrades, with better temperature, load carrying and stability performance.



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Dear Aviators

Welcome to this the 21st Issue of Tech Talk. Back in February 2006 Tech Talk 10 covered a range of "Frequently Asked Questions" and I thought it would be a good idea to run through another handful of FAQ's - the answers to which have been provided by Paul Royko - a private pilot, FAA Safety Counselor and an expert in the aviation lubricants industry and Rob Midgley - a qualified Aeronautical Engineer, an instrument rated pilot and formerly Shell's Global technical manager for GA Fuels and Lubricants. You might recall Rob's name as he has contributed to a number of previous Tech Talk Articles over the past 3 years.

With regards the FAQ's in this issue, the questions relate to semi-synthetic, multigrade and single grade oils for the most part and aspects of interchange-ability and effects of these oils on engines etc. So without giving too much away on the covering letter, I hope you find these FAQ's interesting and informative.

Once again, if there are any questions around Aviation Lubes, greases or fluids you would like answered, please send me an email and Shell Aviation will provide you with an answer.

Happy Flying

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I fly only 50 hours a year, live in a relatively humid climate, and my oil temp is below 71 deg C. Will any oil protect my engine?

No. But some companies would like you to believe their products will protect your engine under all conditions. In reality, oils with anti-rusting properties, like AeroShell Oil W 15W-50 and AeroShell Oil W 100 Plus need to be part of a good maintenance and flying programme.

Are AeroShell multigrade and AeroShell single grade oils compatible?

The compatibility question covers two issues: mixing one grade of AeroShell oil with another; and the effects on the engine of changing from one AeroShell grade to the other. If you typically run on AeroShell multigrade, and you find yourself in a place where only AeroShell single grades are available, you can safely add the AeroShell single grade to your engine. They are completely compatible. If you run on an AeroShell single grade during the summer, but want to switch over to AeroShell Oil W 15W-50 Multigrade for the winter, you can safely replace the straight weight with the multigrade at your regular drain interval. The idea that you have to stick with the type of oil you started with comes from the days of unusual chemistry when the resulting oils were incompatible. All approved SAE J-1899 (former MIL-L-22851) and SAE J-1966 (former MIL-L-6082) AeroShell oils are compatible. For example, if you have a high-time engine run on ashless dispersant oils and need to replace a cylinder, you can switch to a mineral oil for 50 hours or so to break in the new cylinder. The only time Shell recommends against switching is in a high-time engine run exclusively on straight mineral oil. Here, a switch to ashless dispersant oil can loosen deposits left behind by the mineral oil.

Can I switch from a straight AeroShell mineral oil to a single grade ashless dispersant oil, or even a semi-synthetic multigrade oil?

All AeroShell oils are compatible and can be mixed with each other. Many single grade customers try AeroShell Oil W 15W-50 during the colder part of the year, then convert to using it year round. Others, however, choose to alternate between single grade and multigrade depending on the time of year. Either system works well because AeroShell oils are entirely compatible and can be interchanged as desired. In addition, if you need to replace a cylinder on a mid-time engine, you can switch from AeroShell Oil W single grade or AeroShell Oil W 15W-50 to a straight AeroShell mineral oil for one or two changes to break in the new cylinder. Then you can switch back to the ashless dispersant oil after the rings are properly seated. If you have a mid-time engine that has been run exclusively on a straight mineral oil and wish to try an ashless dispersant oil, use caution. The introduction of an ashless dispersant oil into your engine could loosen up some of the carbon deposits. So check your oil screens and filters often to ensure against oil starvation and/or oil screen collapse.

Will the synthetic portion of semi-synthetic AeroShell Oil W 15W-50 harm an aircraft engine?

A number of pilots have asked this question. The answer is a definite no. When Shell first started evaluating multigrade aviation piston-engine oils over 25 years ago, testing proved that multigrades formulated only with mineral base oils did not have adequate base oil viscosity (thickness) to properly lubricate all high load points in the engine. Then we tested and flight evaluated a formulation made with all-synthetic base oils. This formulation had

excellent antiwear characteristics in all tests run. However, in the flight evaluations, some engines would reach 600 to 900 hours, then lose oil consumption control and/or compression. When the engines were disassembled, we found that the piston rings were covered with a gray tacky substance that was primarily made up of the lead by-products of combustion (from the use of leaded aviation gasoline). Although synthetics are excellent lubricants with good high temperature stability and very good low temperature flow characteristics, they are relatively poor solvents.

In an aircraft engine, the lead by-products of combustion must be dissolved by the base oil so they can be carried away from the ring belt area and removed from the engine when the oil is changed. Anticorrosion, antiwear AeroShell Oil W 15W-50 is formulated with 50% synthetic base oils to give it the excellent low temperature flow needed for quick lubrication during cold starting. The synthetic base oils, along with the unique antiwear additive system, give it antiwear protection unequalled by any other product on the market. In addition, its mineral base oils provide lead absorbency to guard against ring sticking and excessive sludge. The bottom line: The synthetic component of AeroShell Oil W 15W-50 will not harm your engine. Instead, it gives you the best of both oils.

Do AeroShell Oil W 15W-50 and AeroShell Oil W 100 perform the same in an engine?

The oils are similar, but there are some differences. The biggest difference is in cold flow characteristics. AeroShell Oil W 100 is up to 10 times thicker at cold temperatures than AeroShell Oil W 15W-50. However, at normal operating temperatures (around 93°C), both oils will have

the same thickness or viscosity. Another major difference is that AeroShell Oil W 15W-50 and AeroShell Oil W 100 Plus have an antiwear additive which is not in AeroShell Oil W 100. This additive, along with the semisynthetic base oils, helps reduce friction and improve flow in AeroShell Oil W 15W-50. These additives improve lubrication and reduce oil consumption past the oil rings. Conversely, the improved flow can increase oil loss through leaks or loose intake valve guides. So your oil consumption may go up or down if you switch from AeroShell Oil W 100 to AeroShell Oil W 15W-50. The improved flow and reduced friction characteristics of AeroShell® Oil W 15W-50 will also help reduce oil temperatures as opposed to using AeroShell Oil W 100. This is particularly important in engines that run hot, like turbocharged, high performance or aerobatic aircraft engines. Pilots should always remember to monitor oil temps to ensure that they're not too hot. In cold weather, you should also make sure that the engine temperature is high enough to boil off the water that naturally accumulates in the crankcase. Temperatures in the 82° to 93°C range are recommended for most applications. Finally, if you have a marginal or slipping starter clutch, the antiwear additive in AeroShell Oil W 15W-50 may cause it to slip more than AeroShell Oil W 100. Understanding these differences can help you select the grade of AeroShell that's right for your plane.

Does the W in AeroShell Oil W stand for winter?

No. The W is just a model designator to differentiate between AeroShell ashless dispersant oils (Oil W) and straight mineral AeroShell oils which have no letter designator.