

Royal Purple Info

As you may know, Royal Purple is well known in racing circles. The chemistry they use is something AMSOIL, Inc. chooses not to use in their oil formulation. One of Amsoil's big selling points is extended drain intervals, such as our 25,000 mile and 35,000 mile oil change intervals. Some additive chemicals may cause adverse conditions when used for long periods.

Royal Purple uses a different chemistry than most oil producers. They are one of only a handful of marketers using Molybdenum Disulfide (Moly) in their oil **formulations at these higher levels**.

Moly is a processed mineral that is similar in appearance to graphite. Moly has good lubricating properties when used either by itself (in dry power form or as an additive to oil or other lubricants).

Particles of the Moly can come out of suspension and agglomerate. Over time this may actually clog or partially clog oil filters or oil lines and the remainder normally settles in the bottom of the oil pan. This seems to be more likely when using extended drain intervals. The only test we ran on Royal Purple involved their 20W50 Racing oil versus our AMSOIL Series 2000 Synthetic 20W50 Racing Oil (TRO). We ran two 4 ball wear tests with different parameters, a spectrographic baseline, FTIR scan and volatility tests. The Royal Purple showed a significantly high volatility rate with a 12.51% boil off rate. This compares to the AMSOIL TRO with only a 4.47% volatility rating. Wear scars were also smaller with the TRO. For example the AMSOIL TRO left a .41mm scar and the Royal Purple oil left a .66mm scar. The lower the scare damage number the better! There was also a surprising difference in the viscosity index. The RP has a VI of 129 versus 155 for the TRO. The higher the VI, the better the viscosity stays in place at high temperatures.

Note: This information was provided by AMSOIL, Inc. Tech Department. An independent lab tested the Royal Purple 20W-50 racing oil against the AMSOIL 20W-50 racing oil. The results are posted above. Test results found Moly in the Royal Purple oil sample.

Additional Test Results of Amsoil and Royal Purple and Other oils:

Oil TESTs

Ok Ladies and Gents. This is alot to read I know, but you will better understand the meat and potato's of the Oil industry. This is what most comercials don't even discuss. Beyond all the tout, and meaningless phrases, and flashy nothings, this is the **TRUTH**.

Besides what are you putting in your engine.... oh thats right the OIL!!!! Please feel free to do some reasearch on your own.

The chart shown below was part of an article written by a gentleman and posted to the newsgroups. He has compiled important data regarding many of the top conventional and synthetic oils on the market and put them in a chart for easy comparison. Along with this chart he has provided some descriptions of what the numbers represent. **These figures have not been updated recently on this page. For the latest numbers please see our AMSOIL tech bulletins and compare with the latest tech specs from manufacturer websites.**

Please take note that at the time of this compilation the only two oils that really match up with AMSOIL (according the figures below) are Mobil 1 and Red Line. These are both exceptional oils, but you will find that in most viscosity grades AMSOIL's specs (if taken as a whole) come out better than both of them. It

should also be said that these specifications, although helpful in determining the general quality of an oil, do not tell the whole picture. Noack volatility test scores and wear scar tests are also very important, and in these two areas AMSOIL stands on top for every test we've seen. **In fact, Mobil 1's new Tri-Synthetic 5W-30 and 0W-30 formulations are actually now surpassed by most other synthetic oils we've tested on the Four Ball Wear Test.**

Also important, but not listed in the charts below, is the fact that AMSOIL Synthetic Oils use more top quality base stocks than any other oil and have a better detergent additive package as well. That, coupled with their superior air and oil filtration technologies, make AMSOIL Synthetic Oils and automotive products the best choice out there for anyone who wants improved performance and considerable pocketbook savings.

Here is the Newsgroup Article:

First, I will answer a couple of questions asked by another. Yes, it is OK to mix mineral and synthetic oils. One of the early synthetics used was a Polyalkylene Glycol. This was totally incompatible and would gel when mixed. This has not been used for years for automotive lubrication. All common synthetics used for engine lubrication now days are a Polyalphaolefin (Mobil 1) or a Dibasic Organic Ester type (AMSOIL). These are fully compatible with conventional oils. In fact Golden Spectro and AGIP Sint 2000 are mixtures of mineral and synthetic oils. It is always best to mix oils with the same rating (SG). This insures that the additive packages are compatible and will maintain their effectiveness.

(NOTE: Enviro-Guard' .02 - We wouldn't recommend mixing conventional oil with synthetic oils as the overall mix will have lesser lubrication qualities and a shorter drain interval than completely synthetic.)

All engine oils use an organic Zinc compound as an extreme pressure/anti wear additive. Spectro adds more to their Motorcycle oil than to the car oil because Zinc is a poison to catalytic converters. You will also see that some "car" oil contains more than their motorcycle oil. The difference in Zinc content between .11% and .16% is insignificant to the converter. The little data I saw on the oils packaged by the motorcycle manufacturers indicated that they were no better than the top automotive oils. While most were good, they didn't offer anything the cheaper oils do. (They are in reality just repackaged and in some cases slightly reformulated top grade auto oils).

The following is a slightly modified repost of my original article. I have added a few bits that address some FAQ's. (long)

Choosing the best motor oil is a topic that comes up frequently in discussions between motoheads, whether they are talking about motorcycles or cars. The following article is intended to help you make a choice based on more than the advertising hype. Oil companies provide data on their oils most often referred to as "typical inspection data". This is an average of the actual physical and a few common chemical properties of their oils. This information is available to the public through their distributors or by writing or calling the company directly. I have compiled a list of the most popular, premium oils so that a ready comparison can be made.

If your favorite oil is not on the list get the data from the distributor and use what I have as a data base.

This article is going to look at six of the most important properties of a motor oil readily available to the public: viscosity, viscosity index (VI), flash point, pour point, % sulfated ash, and % zinc.

Viscosity is the measure of how thick an oil is. This is the most important property for an engine. An oil with too low a viscosity can shear and loose film strength at high temperatures. An oil with too high a viscosity may not pump to the proper parts at low temperatures and the film may tear at high rpm.

*****Our .02 again-- Viscosity INDEX or VI in the chart below is a measure of how much an oil's viscosity changes with temperature changes. The higher the VI, the less change that occurs and the better the protection. *****

Flash point is the temperature at which an oil gives off vapors that can be ignited with a flame held over the oil. The lower the flash point the greater tendency for the oil to suffer vaporization loss at high temperatures and to burn off on hot cylinder walls and pistons. The flash point can be an indicator of the quality of the base stock used. The higher the flash point the better. 400 F is the minimum to prevent possible high consumption. Flash point is in degrees F.

Pour point is 5 degrees F above the point at which a chilled oil shows no movement at the surface for 5 seconds when inclined. This measurement is especially important for oils used in the winter. A borderline

pumping temperature is given by some manufacturers. This is the temperature at which the oil will pump and maintain adequate oil pressure. This was not given by a lot of the manufacturers, but seems to be about 20 degrees F above the pour point. The lower the pour point the better. Pour point is in degrees F. **% sulfated ash** is how much solid material is left when the oil burns. A high ash content will tend to form more sludge and deposits in the engine. Low ash content also seems to promote long valve life. Look for oils with a low ash content.

% zinc is the amount of zinc used as an extreme pressure, anti- wear additive. The zinc is only used when there is actual metal to metal contact in the engine. Hopefully the oil will do its job and this will rarely occur, but if it does, the zinc compounds react with the metal to prevent scuffing and wear. A level of .11% is enough to protect an automobile engine for the extended oil drain interval, under normal use. Those of you with high revving, air cooled motorcycles or turbo charged cars or bikes might want to look at the oils with the higher zinc content. More doesn't give you better protection, it gives you longer protection if the rate of metal to metal contact is abnormally high. High zinc content can lead to deposit formation and plug fouling.

The Data: Listed alphabetically

--- indicates the data was not available

**figures last updated April 1998

Please note figures with a (**) at the right side of them, are current figures taken from the prospective web site's of that brand of oil up dated 2002.

Brand	VI	Flash	Pour	%ash	%zinc
20W-50					
AMSOIL(new)	155	474	-47	<.05	---
Castrol GTX	122	440	-15	.85	.12
Exxon High Performance	119	419	-13	.70	.11
Havoline Formula 3	125	465	-30	1.0	---
Kendall GT-1	129	390	-25	1.0	.16
Pennzoil GT Perf.	120	460	-10	.90	---
Quaker State Dix.	155	430	-25	.90	---
Red Line	164	503	-49	---	---
Royal Purple	138	435	-44	---	---
Shell Truck Guard	130	450	-15	1.0	.15
Spectro Golden 4	174	440	-35	---	.15
Spectro Golden M.G.	174	440	-35	---	.13
Unocal	121	432	-11	.74	.12
Valvoline All Climate	125	430	-10	1.0	.11
Valvoline Turbo	140	440	-10	.99	.13
Valvoline Race	140	425	-10	1.2	.20
Valvoline Synthetic	146	465	-40	<1.5	.12

Brand	VI	Flash	Pour	%ash	%zinc
20W-40					

AMSOIL	124	500	-49	---	---
Castrol Multi-Grade	110	440	-15	.85	.12
Quaker State	121	415	-15	.90	---

Brand	VI	Flash	Pour	%ash	%zinc
15W-50					

Chevron	204	415	-18	.96	.11
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Mobil 1	180	430	-55	---	---
Mystic JT8	144	420	-20	1.7	.15
Red Line	166	503	-49	---	---

Brand VI Flash Pour %ash %zinc
5W-50

Castrol Syntec	180	437	-45	1.2	---
Quaker State Synquest	173	457	-76	---	---
Quaker State Prem.Syn	177	435	-35	---	---
Pennzoil Performax	176	---	-69	---	---

Brand VI Flash Pour %ash %zinc
5W-40

Havoline	170	450	-40	1.4	---
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Brand VI Flash Pour %ash %zinc
5W-30 Heavy Duty Diesel

AMSOIL	170	460	-60	<.05	---
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Brand VI Flash Pour %ash %zinc
15W-40

AMSOIL(new)	157	446	-49	<.05	---
Castrol	134	415	-15	1.3	.14
Chevron Delo 400	136	421	-27	1.0	---
Exxon XD3	---	417	-11	.90	.14
Exxon XD3 Extra	135	399	-11	.95	.13
Kendall GT-1	135	410	-25	1.0	.16
Mobil 1 Super Syn (NEW)	155	491	-49	---	---
Mystic JT8	142	440	-20	1.7	.15
Red Line	155	495	-40	---	---
Royal Purple	149	400	-49	---	---
Shell Rotella w/XLA	146	410	-25	1.0	.13
Valvoline All Fleet	140	---	-10	1.0	.15
Valvoline Turbo	140	420	-10	.99	.13

Brand VI Flash Pour %ash %zinc
10W-30

AMSOIL	171	464	-54	<.05	---
AMSOIL XL-7500	148	471	-54	<.05	---
Castrol GTX	140	415	-33	.85	.12
Castrol Syntec	157	455	-54	---	.10
Chevron Supreme	150	401	-26	.96	.11
Exxon Superflo Hi Perf	135	392	-22	.70	.11
Exxon Superflo Supreme	133	400	-31	.85	.13
Havoline Formula 3	139	430	-30	1.0	---
Kendall GT-1	139	390	-25	1.0	.16

Mobil 1	---	430	-60	---	---	
Mobil 1 Super Syn.(NEW)	145	455	-49	---	---	**
Pennzoil PLZ Turbo	140	410	-27	1.0	---	
Quaker State	156	410	-30	.90	---	
Quaker State Prem Syn	148	440	-40	---	---	**
Red Line	150	475	-40	---	---	
Royal Purple	148	400	-49	---	---	**
Shell Fire and Ice	155	410	-35	.90	.12	
Shell Super 2000	155	410	-35	1.0	.13	
Shell Truck Guard	155	405	-35	1.0	.15	
Spectro Golden M.G.	175	405	-40	---	---	
Unocal Super	153	428	-33	.92	.12	
Valvoline All Climate	130	410	-26	1.0	.11	
Valvoline Turbo	135	410	-26	.99	.13	
Valvoline Race	130	410	-26	1.2	.20	
Valvoline Synthetic	140	450	-40	<1.5	.12	

Brand VI Flash Pour %ash %zinc
5W-30

AMSOIL	186	478	-60	<.05	---	
AMSOIL XL-7500	160	464	-60	<.05	---	
Castrol GTX	156	400	-35	.80	.12	
Chevron Supreme	202?	354	-46	.96	.11	
Chevron Supreme Synth.	165	446	-72	1.1	.12	
Exxon Superflow HP	148	392	-22	.70	.11	
Havoline Formula 3	158	420	-40	1.0	---	
Mobil 1	150	430	-65	---	---	
Mobil 1 Super Syn (NEW)	169	455	-54	---	---	**
Mystic JT8	161	390	-25	.95	.10	
Quaker State	165	405	-35	.9	---	
Quaker State Prem Syn	151	440	-49	---	---	**
Red Line	165	455	-49	---	---	
Royal Purple	160	395	-44	---	---	**
Shell Fire and Ice	167	405	-35	.9	.12	
Unocal	151	414	-33	.81	.12	
Valvoline All Climate	135	405	-40	1.0	.11	
Valvoline Turbo	158	405	-40	.99	.13	
Valvoline Synthetic	160	435	-40	<1.5	.12	

Brand VI Flash Pour %ash %zinc
0W-30

AMSOIL	188	460	-76	---	---	
Mobil 1	175	460	-65	---	---	
Mobil 1 Super Syn (NEW)	176	450	-65	---	---	**

All of the oils above meet current SG/CD ratings and all vehicle manufacturer's warranty requirements in the proper viscosity. All are "good enough", but those with the better numbers are icing on the cake. The more expensive synthetic oils; AMSOIL, Mobil 1, and Spectro offer the only truly significant differences, due to their superior high temperature oxidation resistance, high film strength, very low tendency to form deposits, stable viscosity base, and low temperature flow characteristics. Synthetic oils are superior lubricants compared to traditional petroleum oils. You will have to decide if their high cost is justified in your application.