# Overview - 50 Fuel Comparison to Mixed Pump Gas

by Tim Ard Forest Applications Training, Inc.

A statement triggered a question regarding the oil specs/configuration of 50 Fuel. The statement was that certain saws run higher temperatures than others and the oil in it would not handle the temperature demands of their saw. The 50 Fuel has a rating of JASO FD which is about the best rating you can have for two-cycle air cooled oils. Both the major brand Husqvarna Oil and the 50 Fuel has the JASO FD rating.

I found both the oils are capable of doing their job in any two-cycle air cooled engine. That's my feelings from past experience with small engines and many hours of operation. I have never experienced a lubrication breakdown failure when oil is mixed properly.

I have made the statement several times over the years that I see very little problem with mixing oils or amounts, what I feel to be the problem in most failure scenarios is pertaining to the fuel. 1. Fuel with no oil added. 2. Fuel that is high in vapor pressure and or low in octane. 3. Fuel that contains alcohol (ethanol) in a high percentage. 4. Fuel that is virtually old "dead". If not finding those things to be a problem then it is usually a lack of tuning knowledge that causes failures. Running too long with improper settings (too lean or too rich), dirty, dirty filter, etc. I have not found many manufacturing defects in my travels and experiences. Usually it was related to the fuel or the screwdriver.

The findings in the trial data show that 50 Fuel is as good if not slightly better in keeping muffler and exhaust temperatures within a consistent range of the Gas Mixed. The 50 Fuel had a much more stable idle rpm, throttle response and top rpm was controlled much better. I feel this has a lot to do with a better control of vapor pressure of the fuel. The 50 Fuel maintains about 7.3 psi at 100 degrees. I think you will find pump gas pressures to be much higher (15psi+ at some pumps). The inlet needle and metering in the carburetor have a much easier time adjusting to the lower 50 Fuel vapor pressure. Remember, a inlet needle in a chain saw carburetor reacts to a spring pressure operated by atmosphere pressure in most cases, a little less than 15 psi. When gas pressures are close to 15 psi the metering is not working properly. Different demands of the engine are not met, the engine leans out and fuel leaks can occur.

Given the findings, the real benefits of the 50 Fuel are controlled rpm and a more stable run than the 10% ethanol midgrade fuel mix. This should lead to a much longer engine life, a huge benefit to the operator. The seperate or combination of the vapor pressure and or the ethanol making the idle high and the high rpm unstable is the issue that will pound the inside of the engine from over speeding the design limits. The 50 Fuel should help to maintain the specifications built into the equipment by the manufacturer simply by stabilizing the fuel source. This really doesn't happen with pump gasoline today across the country. Stabilizers, boosters, etc can only enhance or stabilize a good base fuel. That's the variable that 50 Fuel overcomes.

From the author - This trial was not one of scientific exacts. Please find though that there are variables that can exist in any comparison. If you disagree with my findings I would be more than happy to entertain learning from yours.

# 50 Fuel - Run test

Objective: To check operating temperatures and rpm characteristics of common mixed gasoline and Husqvarna mix oil vs. 50 Fuel pre-mix fuel.

Gas mix was made with Husqvarna 50-1 smoke less oil and mid grade 89 octane gasoline with pump listing of 10% ethanol.

Test Day was high humidity and 47 to 50 degrees F. Hiram, GA approximately 800 ft above sea level.
The Muffler skin temps were checked with a Craftsman 1000 degree handheld infrared style automotive pyrometer.
The temp was checked on the front skin of the muffler after full throttle for 10 seconds, the chain stopped, reading taken.
The exhaust gas temp was taken at the muffler exit after full throttle and held for highest reading, approximately 45 seconds.
Two saws used: A Husqvarna 575xp with 20" bar and chain free spin no load. A Husqvarna 460 with 20" bar and chain free spin no load.

Both saws were warmed. First runs were with 50 Fuel. Changed to mixed gas, then back to 50 Fuel.

| Saw | Fuel | Idle Speed | High RPM | Muffler Skin Temp 1 | 2 | 3 | 4 | Average Degrees | Exhaust gas temp |
|---|---|---|---|---|---|---|---|---|---|
| Husqvarna 575 | 50 Fuel | 2680 | Governor (1) | 376 | 306 | 342 | 350 | 343.5 | 513 |
| Husqvarna 575 | Gas Mixed | 3120 | Governor (1) | 372 | 399 | 403 | 387 | 390.25 | 544 |
| Husqvarna 575 | 50 Fuel | 2690 | Governor (1) | 370 | 392 | 372 | 381 | 378.75 | |
| | | | | | | | | | |
| Husqvarna 460 | 50 Fuel | 2940 | 13200-13300 | 230 | 230 | 219 | 232 | 227.75 | |
| Husqvarna 460 | Gas Mixed | 3280 | 13450-13610 (2) | 281 | 217 | 287 | 247 | 258 | |
| Husqvarna 460 | Gas Mixed | 3160 | 13500 (3) | | | | | | 542 |
| Husqvarna 460 | 50 Fuel | 2740 | 13300 (3) | | | | | | 532 |

Note (1) The 575 has a governor system. The saw was held wide open after warm up. The rpm was over the governor actuation and the tach would lose its reading on all trials. The adjustment of the carburetor needle was to its richest setting. There was noticeably more throttle left using regular fuel which indicated the over speeding was higher with the Mixed Gas.

Note (2) The top rpm was higher with the Gas Mix. The rpm would have gone higher when held longer.

Note (3) The Gas mix run was held at 13500 for the exhaust gas check. It would have gone higher. The 50 Fuel run stabilized at 13300 rpm and held there

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