

TESTING AUTO FUEL FOR ALCOHOL

First, some precautions:

1. Gasoline and alcohol are flammable - extremely so.
2. Gasoline when shaken will vaporize and cause a pressure build-up in a closed container. Don't use a closed container - hold your hand over it to contain the fuel and be careful of excess pressure build-up.
3. Wear eye protection. Gasoline can cause severe chemical burns to sensitive tissue.
4. Wear appropriate clothing. This is a messy process.
5. Gasoline is an extremely efficient solvent. Use containers that can resist chemicals. You may find a suitable container at a photo store.
6. If you use a glass container - be careful of containing pressure - do not cap with anything other than your hand.
7. We suggest you protect your hands with fuel-resistant gloves.

Next, the proper procedure for fuel testing is contained in the EAA Aviation

Foundation Field Information No. 306. This is included in the Auto Fuel Summary available from: EAA Flight Research Center, 1145 W. 20th Ave., Oshkosh, WI 54901, phone 414/426-4843, Fax 414/426-4881.

Now, to the actual testing. You will find it is hard to get thorough mixing of water, the alcohol and the fuel. We suggest you put a drop or two of food coloring in the water used to make it visible.

As the Field Information 306 suggests, mark your container. Ours was 1000 ML or 1 liter container with graduations.

We used 900 ML of auto fuel known to contain alcohol. 100 ML of colored water was added and the container was stirred and shaken . . . see all the above precautions.

We ended up with an apparent volume increase in the water of 50 ML. Our formula is from the EAA Aviation Foundation Field Information No. 306:

$$(V-100) / 100 = \%(900)$$

Where V= final apparent volume of water

$$V = 150, \text{ then } (150-100) / 100 = 5.6\% (900)$$

This is the sample of the field test for determining the presence of alcohol in gasoline. Under 1% apparent alcohol in the gasoline will probably not have any adverse effect. Up to 5%, we suggest you don't leave it in the aircraft for any period of time.

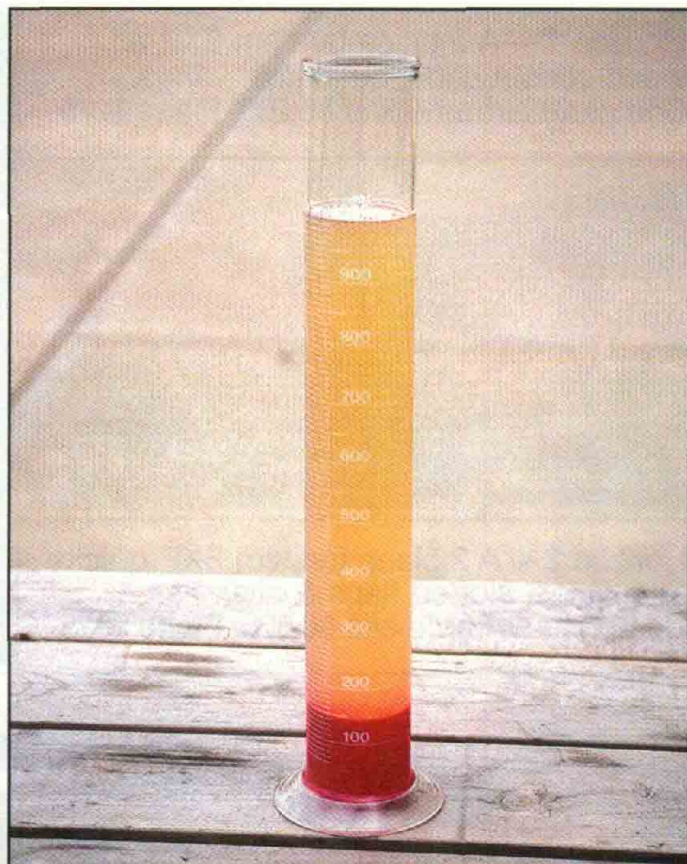
On a final note, grain alcohol or ethynol is C_2H_5OH , the stuff we occasionally drink.

Wood alcohol is Methanol, $CH_2(OCH_3)_2$. (Used in antifreeze, as a fuel and a solvent.)

When alone, each form of alcohol has a definite and distinct odor. When mixed in gasoline it is very difficult to tell by odor which alcohol is in the fuel. Methanol is a strong solvent and may attack gaskets, hoses and composite floats in the fuel system. It would be considered the "worst" of the two alcohols in its effect on the substances.



900 ML of gasoline known to contain alcohol.



900 ML of gasoline plus 100 ML of colored water added. The apparent volume increase in the quantity of water after mixing. The alcohol and the water combined as alcohol has a greater affinity for water than it does for gasoline.