

Is Reformulated Gasoline a "New" Gasoline?

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Reformulated gasoline (RFG) is gasoline that is blended such that, on average, it significantly reduces Volatile Organic Compounds (VOC) and air toxics emissions relative to conventional gasolines. Nevertheless, RFG fuel parameter values are well within the ranges of fuel parameter values of conventional gasoline as shown in the attached table. Essentially, the RFG Program is a "new program," but RFG is not a "new gasoline."

Differences Between RFG and Conventional Gasoline

Reid Vapor Pressure(RVP)

- RVP is a measure of how quickly fuel evaporates.
- RVP is reduced in RFG only during the summer.
- RVP reduction provides the majority of VOC emission reductions from RFG.
- RVP level in RFG is still within the range of RVP levels in conventional gasoline.
- Vehicle performance should not be affected.

Benzene

- Benzene is a proven human carcinogen.
- Benzene reduction provides the majority of air toxics emission reductions from RFG.
- RFG's benzene levels are still well within the range of benzene levels in conventional gasoline.
- Vehicle performance should not be affected.

Oxygenates

- Methyl Tertiary-Butyl Ether (MTBE) and ethanol (EtOH) represent the majority of oxygenate use in RFG.
- Oxygenates are required to be present in RFG by the 1990 Clean Air Act.
- The required concentration of oxygenates in RFG is lower than that historically blended in gasohol or the oxygenated fuels programs.
- Considerable in-use experience (see below) with oxygenate additives prior to the RFG program suggests that vehicle performance should not be affected.

Other Fuel Differences in RFG

- The table on page 3 outlines the changes in fuel parameter values in RFG.
- Changes other than those discussed above are due primarily to dilution from oxygenates.
- These minor fuel changes are well within the range of conventional gasoline and should not impact vehicle performance.
- The auto manufacturers have been strongly supportive of the RFG program due in part to the constraints the program places on the variability in the quality of gasoline (e.g., lower probability for "bad gas").

In-use Experience with Oxygenates

- Oxygenates have been used as gasoline extenders and octane enhancers in gasoline since the 1970's without notable problems.
- Denver and Phoenix started the first oxygenated gasoline programs in the late 1980's as a means of reducing carbon monoxide (CO) emissions.
- In 1990, EtOH was present in nearly 7% of the U.S. gasoline pool and MTBE in nearly 25% (in lower concentrations).
- Oxygenates will probably continue to be used in conventional gasoline, primarily as octane extenders.
- Oxygenate use increased substantially with the start of the federal oxygenated fuel program (for controlling CO) in 1992.
 - Required in 39 cities across the country
 - MTBE with 2/3 market share and ethanol with 1/3, but these shares vary with local market conditions
- Oxygenate use increased again recently with the beginning of the RFG program.
 - Required in 9 cities across the country
 - Many other cities and entire states voluntarily opted into the program at the request of their governors

Fuel Parameter Values (national basis)					
	Conventional gasoline		Gasohol	Oxyfuel (2.7 wt% oxygen)	Phase I RFG
	Avg1	Range2	Avg	Avg	Avg
RVP3	8.7-S	6.9-15.1	9.7-S	8.7-S	7.2/8.1-S
(psi)		11.5-W	11.5-W	11.5-W	11.5-W
T50 (°F)	207	141-251	202	205	202
T90 (°F)	332	286-369	316	318	316
Aromatics (vol%)	28.6	6.1-52.2	23.9	25.8	23.4
Olefins (vol%)	10.8	0.4-29.9	8.7	8.5	8.2
Benzene (vol%)	1.60	0.1-5.18	1.60	1.60	1.0 (1.3 max)
Sulfur (ppm)	338	10-1170	305	313	302 (500 max)
MTBE4 (vol%)	--	0.1-13.8	--	15	11 (7.8-15)
EtOH4 (vol%)	--	0.1-10.4	10	7.7	5.7 (4.3-10)

1. As defined in the Clean Air Act.
2. 1990 MVMA survey.
3. Winter (W) higher than Summer (S) to maintain vehicle performance.
4. Oxygenate concentrations shown are for separate batches of fuel; combinations of both MTBE and ethanol in the same blend can never be above 15 volume percent total.