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Technical specifications

California's cleaner-burning gasoline represents a major advancement in clean-fuel technology. It burns more completely and has a lower evaporative potential.

This backgrounder contains technical information on the California Air Resources Board's specifications for cleaner-burning gasoline.

Background

The cleaner-burning gasoline to be introduced in Spring 1996 is actually "Phase 2" of a two-phase program to significantly reduce air pollution from the combustion of gasoline. The "Phase 1" gasoline modifications that took effect in January 1992 were relatively modest compared to Phase 2.

Phase 1 specifications required detergent additives and reduced the Reid vapor pressure (a measure of how quickly gasoline evaporates) from 9.0 pounds per square inch (psi) to 7.8 psi.

Cleaner-Burning Gasoline Specifications (Phase 2)

Air Resources Board scientists worked closely with the oil and automotive industries in establishing the Phase 2 gasoline standards. These standards provide refineries with the flexibility to choose specific formulations that provide the required air-quality benefits in the most cost-effective manner.

For six of the eight standards, a refiner may choose either the "flat" limit or the "averaging" limit. (Averaging is not allowed for Reid vapor pressure or oxygen.) The flat limit applies to every batch of finished gasoline. The "averaging" limit allows specific batches to exceed the "flat" limit as long as fuel produced over a 180-day period meets the "averaging" limit and never exceeds the "cap" limit. The "averaging" specifications give refiners more blending options and help them control operating costs.

As an alternative to the flat or averaging limits, refiners can make their own changes to the specifications if they can show that emission effects are equivalent to those of the limits. Refiners must use a predictive model developed by Air Resources Board or an emissions test program to demonstrate the equivalency. No exceptions are allowed for the cap limits.



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Cleaner-Burning Gasoline Specifications

Specifications	Phase 1 *	Phase 2		
		“Flat”	“Averaging”	“Cap”
Reid vapor pressure (psi)	7.8	7.0	7.0	7.0
Sulfur (ppmw)	151	40	30	80
Aromatic HC (vol.%,max.)	32	25	22	30
Benzene (vol.%,max.)	1.7	1.0	0.80	1.20
Olefins (vol.%,max.)	9.6	6.0	4.0	10.0
Oxygen (wt.%) **	1.8-2.2	1.8-2.2	NA	1.8 min 2.7 max
Temperature (°F, max.) at 50% distilled	212	210	200	220
Temperature (°F, max.) at 90% distilled	329	300	290	330

* Specifications are only for Reid vapor pressure. The other numbers are estimates of average values for Phase 1.

** The oxygen specification (1.8 to 2.2 percent) has been in force during winter months only since November 1992. The Phase 2 specification is year-round.