## UPDATED INFORMATIVE DIGEST

### Amendments to the California Cleaner-Burning Gasoline Regulations (Amendment Increasing the Oxygen Content Cap)

**Sections Affected:** Amendments to sections 2262.5(b) and 2265(a)(2) of title 13, California Code of Regulations (CCR), and the "California Procedures for Evaluating Alternative Specifications for Phase 2 Reformulated Gasoline Using the California Predictive Model," incorporated by reference in section 2265(a)(2).

### Background

The California Phase 2 reformulated gasoline (CaRFG) regulations were adopted by the California Air Resources Board (the Board or ARB) following a hearing in November 1991 and became applicable in the spring of 1996. The regulations establish a comprehensive set of standards for gasoline designed to achieve the maximum reductions in emissions of criteria pollutants and toxic air contaminants from gasoline-powered motor vehicles. The standards cover sulfur, benzene, olefin, oxygen, and aromatic hydrocarbon contents, the 50-percent and 90-percent distillation temperatures (T50 and T90), and summertime Reid vapor pressure (RVP).

The CaRFG standards include "cap" limits that apply to finished gasoline throughout the California gasoline distribution system. The standards also include more stringent "flat" and "averaging" limits that apply to gasoline when it is first supplied from a production facility (typically a refinery) or an import facility; these will be collectively referred to as the "refiner" limits. The standards are as follows:

| Property | Averaging Limit | Flat Limit | Cap |
|---|---|---|---|
| T50 | 200ºF | 210ºF | 220ºF |
| T90 | 290ºF (DAL not to exceed 310ºF) | 300ºF | 330ºF |
| Olefins | 4.0% | 6.0% | 10.0% |
| Aromatics | 22.0% | 25.0% | 30.0% |
| Sulfur | 30 ppm | 40 ppm | 80 ppm |
| Benzene | 0.80% | 1.00% | 1.20% |
| Oxygen | None | 1.8 wt.% min. to 2.2 wt.% max. | 2.7 wt% max. |
| RVP | None | 7.00 psi | 7.00 psi |

Except in the case of RVP and oxygen content, the regulations provide two compliance options for meeting the limits applicable to gasoline being supplied from a production or import facility. One option is to have the gasoline subject to a "flat limit," which must be met by every gallon of gasoline leaving the production or import facility. The other option is to elect an "averaging limit." The averaging limits established in the regulations for each of the six properties are more stringent than the comparable flat limits. Under the averaging option, the producer may assign differing "designated alternative limits" (DALs) to different batches of gasoline being supplied from the production or import facility. Each batch of gasoline must meet the DAL for the batch. A producer or importer supplying a batch of gasoline with a DAL above the averaging limit must, within 90 days before or after, supply (from the same facility) sufficient quantities of gasoline subject to more stringent DALs to fully offset the excess over the averaging limit.

The CaRFG regulations also contain a compliance mechanism under which a producer or importer may use the "California Predictive Model" to identify alternative flat and averaging limits applicable when gasoline is supplied from the production or import facility. The Predictive Model provisions, which were adopted in 1994, consist of mathematical equations which estimate the changes in exhaust emissions of hydrocarbons (HC), oxides of nitrogen (NOx), and four toxic air contaminants that result from different gasoline formulations. An alternative gasoline formulation is acceptable if the percent change in emissions is less than or equal to 0.04 percent for HC, NOx, and the potency-weighted sum of the toxic air contaminants. No alternative limit may exceed the cap limit for the property.

The standards for oxygen content are administered differently from the rest of the standards. In most cases, CaRFG-compliant gasoline must have an oxygen content between 1.8 and 2.2 weight percent (wt.%). However, producers and importers may use the Predictive Model mechanism — or an analogous mechanism in which alternative gasoline formulations are certified based on a vehicle test program — to establish a maximum oxygen content limit as high as the 2.7 wt.% cap limit. Gasoline formulations meeting the Predictive Model or vehicle testing criteria are allowed to have less oxygen than 1.8 wt.%, including zero oxygen, outside specified winter periods. Until recently, alternative formulations with oxygen contents below 1.8 wt.% were not allowed in the wintertime throughout the state. However, amendments that became effective September 21, 1998 now allow alternative formulations with reduced or no oxygen contents in the wintertime except in the following areas: the counties of Los Angeles, Orange, Riverside, Ventura and Imperial, and through January 31, 2000 only, Fresno and Madera counties, and the Lake Tahoe Air Basin.

**The Amendments**

At a December 11, 1998 hearing, the Board amended the regulations and the incorporated "California Procedures for Evaluating Alternative Specifications for Phase 2 Reformulated Gasoline Using the California Predictive Model," to increase the "cap" limit for oxygen from 2.7 to 3.5 wt.%. The amendments allow refiners and importers to supply from refineries and

import facilities batches of CaRFG having an oxygen content between 2.7 wt.% and 3.5 wt.% as long as the batches meet the requirements of the California Predictive Model.

**Comparable Federal Regulations**

The 1990 amendments to the federal Clean Air Act (FCAA) require U. S. Environmental Protection Agency (U.S. EPA) to adopt regulations regarding reformulated gasoline. (FCAA §211(k).) U.S. EPA has adopted these regulations as 40 C.F.R. §§80.40 to 80.82. In California, they apply in San Diego County, the greater Los Angeles Area (Los Angeles, Orange and Ventura counties, and parts of Riverside and San Bernardino counties), and the greater Sacramento area (Sacramento County and parts of Yolo, Solano, Sutter, Placer, and El Dorado counties).

The FCAA provides that the federal regulations must require no NOx increase, a minimum 2.0 percent by weight oxygen content (with certain exceptions), a maximum 1.0 percent by volume benzene content, and limits on heavy metals. The federal regulations must also specify performance standards for hydrocarbons in the high ozone period and toxic compounds year-round in two phases — the first starting in 1995 and the second starting in 2000. The U.S. EPA regulations identify a "complex model" that must now be used in complying with the requirements.

While the federal RFG standards apply in the federal RFG areas in California, the ARB has worked with U.S. EPA and gasoline producers to avoid unnecessary duplication of the enforcement requirements. In 40 C.F.R. §80.81, U.S. EPA has exempted California producers from many of the federal enforcement requirements from March 1, 1996, to January 1, 2000, as long as certain criteria are met.