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Advisory	Table of Motor Vehicle Fuel Specifications, Test Methods, and Reproducibilities

Number 152 January 30, 1998

GASOLINE AND DIESEL FUEL SPECIFICATIONS, LEGAL AND EQUIVALENT TEST METHODS, AND REPRODUCIBILITIES

Sections 2250 through 2282 of Title 13 of the California Code of Regulations (CCR) specify California Air Resources Board (CARB) motor vehicle fuel standards and test methods used in measuring the physical and chemical properties of gasoline and diesel fuel. The table on the back of this advisory summarizes these properties, standards, and test methods. Test methods deemed equivalent by the Air Resources Board are also shown in the table. Please note that the test methods which are underlined are the methods currently used by the Compliance Division of CARB.

Note that there are no test methods for deposit control additives listed in the table. Section 2257 contains performance criteria that deposit control additive/gasoline formulations must meet to be certified by the Air Resources Board. Once a formulation is certified, testing for the particular additive is performed using the test method specified by that additive's manufacturer. These methods vary for each additive, and are not listed in the table.

For your information, the table only lists CARB standards and test methods. Standards and test methods used by other state and federal agencies are not listed. The standards enforced by the California Department of Food and Agriculture's Division of Measurement Standards (DMS) are contained in CCR Title 4, Section 4140 (gasoline) and Section 4143 (diesel).

If you have any questions about this advisory, please contact Mr. Mark Stover, Manager, Fuels Enforcement Section at (916) 322-2056. Written inquiries may be addressed to:

James R. Ryden, Chief
Compliance Division
California Air Resources Board
Post Office Box 2815, Sacramento, CA 95812

Advisories

CARB GASOLINE SPECIFICATIONS AND TEST METHODS

CCR Section	Gasoline Parameter		Test Method	Flat	DAL	Cap	Units	Reproducibility
2262.1	Reid Vapor Pressure		ASTM D323-58 or 13 CCR Section 2297	7.00	---	7.00	psi	0.30
2262.2	Sulfur Content[a]	≥10 ppm	ASTM D2622-94 (modified) *Equiv: ASTM D5453-93.*	40	30	80	ppm	for 2622: 10 to 30 ppm: 40.5% (x) for 2622: >30 ppm 19.2% (x)
		1 to 10 ppm	ASTM D5453-93 *Equiv: ASTM D4045-92 (modified).*					for 5453: $0.2217(x)^{0.92}$
2262.3	Benzene Content		ASTM D5580-95 *Equiv: GC/FTIR*	1.00	0.80	1.20	v%	$0.1409(x)^{1.133}$
2262.4	Olefin Content[a]		ASTM D1319-9X *Equiv: Oxy-PONA.*	6.0	4.0	10.0	v%	$0.819(x)^{0.6}$
2262.5	Oxygen Content		ASTM D4815-94 *Equiv: GC/FTIR*	1.8 to 2.2	---	2.7[b]	w%	see test method
2262.6	Distillation, T50		ASTM D86-90 *Equiv: ASTM D86-96.*	210	200	220	deg F	see test method
	Distillation, T90			300	290[c]	330	deg F	see test method
2262.7	Aromatic Hydrocarbon Content		ASTM D5580-95 *Equiv: GC/FTIR*[e]	25.0	22.0	30.0	v%	1.4
2253.4	Lead Content		ASTM D3237-79	0.05	---	---	gm/gal	0.01
2253.4	Phosphorus Content		ASTM D3231-73	0.005	---	---	gm/gal	0.0005
2254	Manganese Content		None specified, using ASTM D2622-94	none added	---	---	ppm	---
2250	Bromine Number[d] (small refiner)		ARB Test Method 8/13/87	30.0	---	---	---	3
2252	Sulfur Content[d] (small refiner)		ASTM D2622-87 (150 to 5000 ppm)	300	---	---	ppm	0.16(x)
2257	Deposit Control Additive		Specifications are listed in the individual deposit control additive certifications.					

Please see: Section 2264 on DAL Averaging, Section 2265 on Predictive Model Formulations, and Section 2266 on Certified Formulations.
Note: for reproducibilities, x = test result. Footnotes: "a" = not required for qualifying small refiners until 3/1/98. "b" = 1.8% winter minimum. "c" = not to exceed 310° F. "d" = until 2/28/98. "e" = with correlation to ASTM D5580-95. CARB Compliance currently uses underlined methods. This table was revised on January, 1998.

CARB DIESEL FUEL SPECIFICATIONS AND TEST METHODS

CCR Section	Diesel Parameter	Test Method	Specification	Reproducibility
2281	Sulfur Content	ASTM D2622-94 *Equiv: ASTM D5453-93.* *Equiv: Canadian/CGSB-3.0, No.16.0-95, Method S121.*	500 ppm	R = 0.16(x)
2282	Aromatic Hydrocarbon Content	ASTM D5186-96	10 v%	R = $0.75\ (x)^{0.23}$ (where x is wt%)[f]
			small refiner: 20 v%	
2282(g)	The list below are additional parameters for Certified Diesel Formulations (alternative formulations) specified in the regulation:			
	Polynuclear Aromatic Hydrocarbon Content (PNA)	ASTM D5186-96	Specified in the formulation.	R = for x < 5.0 w%: $0.47\ (x)^{0.45}$ for x > 10 w%: $1.77\ (x)^{0.50}$
	Nitrogen Content	ASTM D4629-96	Specified in the formulation.	$0.85\ (x)^{0.54}$ x = average of 2 test results
	Cetane Number	ASTM D613-84	Specified in the formulation.	2.5 @ 40[g] 2.6 @ 44 2.9 @ 28 3.1 @ 52 3.3 @ 56
	Check the executive order for each certified diesel formulation for any additional specifications.			

Note: for reproducibilities, x = test result.
Footnotes: "f" = Correlation equation: ArHC v% = (0.916)(ArHC w%) + 1.33.
"g" = Reproducibility values for intermediate and higher cetane numbers to be obtained by linear interpolation.
Methods underlined are currently used by CARB Compliance Division. This table was revised on January, 1998.