

# BRIEF SUMMARY: CARB Phase 3 Ethanol Specifications and Test Methods

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This summary is not a legal document and is not intended to be used in lieu of the regulations but as an aid to understanding the specifications of the regulated fuel properties.

CCR Section	Parameter	Test Method	Flat	Averaging (DAL)	Cap	CARBOB Cap Limits	Units	Reproducibility
<b>Denatured Ethanol Standards</b>								
2262.9	Aromatic Content (ETOH)	<u>ASTM D7576-10 (2010)</u> <sup>a</sup>	1.7				v%	0.120 (x + 0.5) x = vol%
2262.9	Benzene Content (ETOH)	<u>ASTM D7576-10 (2010)</u> <sup>a</sup>	0.06				v%	0.142 (x + 0.03) x = vol%
2262.9	Olefin Content (ETOH)	<u>ASTM D7347-07e1 (2007)</u> <sup>a</sup>	0.5				v%	None specified
2262.9	Sulfur Content (ETOH)	<u>ASTM D5453-93</u>	10				ppm	0.2217(x <sup>0.92</sup> )
<b>Additional Standards Required Based on ASTM D 4806-99.</b>								
2262.9	Ethanol	ASTM D5501-94 (1998)ε1	92.1 min				v%	
2262.9	Methanol		0.5				v%	
2262.9	Solvent-washed Gum	ASTM D 381-00, air jet apparatus	5.0				mg/100ml	
2262.9	Water	ASTM E 203-96 or ASTM E 1064-00	1				v%	
2262.9	Denaturant <sup>b</sup>		1.96 - 5.00				v%	
2262.9	Inorganic Chloride	ASTM D 512 - 89 (1999) Procedure C (modified)	40 (32)				mass ppm (mg/l)	
2262.9	Copper	ASTM D 1688-95 Test Method A (modified)	0.1				mg/kg	
2262.9	Acidity (as acetic acid)	ASTM D 1613-96 (1999)	0.007 (56)				mass % (mg/l)	
2262.9	pHe	ASTM D 6423-99	6.5 - 9.0					
2262.9	Appearance	Determined at indoor ambient temperature; Visibly free of suspended or precipitated contaminants (clean and bright).						
<b>Denaturant Standards<sup>b</sup></b>								
2262.9	Aromatic (in denaturant)	<u>ASTM D5580-02 (2007)</u>	35.0				v%	0.2619(x <sup>0.5</sup> ) x = vol%
2262.9	Benzene (in denaturant)	<u>ASTM D5580-02 (2007)</u>	1.10				v%	0.1087(x <sup>0.64</sup> ) x = vol%
2262.9	Olefin (in denaturant)	<u>ASTM D6550-10 (2010) (modified)</u>	10.0				v%	0.32(x <sup>0.5</sup> ) <sup>c</sup>

a = content may be determined by sampling the denaturant and using method ASTM D5580-00 for aromatics and benzene, and method ASTM D6550-00 (modified) for olefin and multiplying the denaturant result by 0.0500 or the actual denaturant content if less than 5.00% volume.

b = only denaturants allowed are natural gasoline, gasoline components, or unleaded gasoline.

c = x is between 0.3 and 25 m% olefin. Conversion from m% to v% is: (v% olefin) = (0.857)(m% olefin).

Note 1: for reproducibility, x = test result.

Note 2: values are maximums unless otherwise indicated.

Note 3: underline = current CARB enforcement test method.