

DEPARTMENT OF FOOD AND AGRICULTURE  
6790 Florin Perkins Road, Suite 100  
Sacramento, CA 95828

February 1, 2008

NOTICE OF MODIFICATIONS TO TEXT OF  
PROPOSED REGULATIONS

Pursuant to the requirements of Government Code Section 11346.8 (c) and Section 44 of Title 1 of the California Code of Regulations, the Department of Food and Agriculture is providing notice of changes made to proposed regulation Title 4, Division 9, Chapter 6, Article 8 which was the subject of a regulatory hearing on December 17, 2007. These changes are in response to comments received regarding the proposed regulation.

If you have any comments regarding the proposed changes, the Department will accept written, faxed, or e-mailed comments between February 4, 2008 and February 19, 2008. All comments must be submitted to the Department no later than 5:00 p.m. on February 19, 2008.

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All comments received by February 19, 2008, which pertain to the indicated changes will be reviewed and responded to by the Department's staff as part of the compilation of the rulemaking file. Please limit your comments to the modifications to the text.

February 1, 2008  
Date



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Ed Williams, Acting Director  
Division of Measurement Standards

## Article 8. Specifications for Hydrogen Used in Internal Combustion Engines and Fuel Cells

### Text of Modified Regulations

The Department has illustrated changes to the original text in the following manner: regulation language originally proposed is underlined; deletions from the language originally proposed are shown as strikeout using a “-”; and additions to the language originally proposed are double-underlined.

#### **4180. Definitions Used in This Article**

(a) “Fuel Cell” means an electrochemical device used to convert hydrogen and oxygen into electrical energy to power a motor vehicle.

(b) “Internal Combustion Engine” means a device used to ignite hydrogen in a confined space to create mechanical energy to power a motor vehicle.

(c) “Hydrogen Fuel” means a fuel composed of the chemical hydrogen intended for consumption in an internal combustion engine or fuel cell.

NOTE: Authority cited: Sections 12027 and 13446, Business and Professions Code.  
Reference: Sections 13401(c), 13401(h), 13401(i), 13401(m), 13401(r), 13413(a) 13595(a), Business and Professions Code.

**4181. Specifications – Hydrogen Fuel Used in Fuel Cells and Internal Combustion Engines.** Hydrogen fuel used in fuel cells and internal combustion engines shall meet the following requirements:

<u>Specification</u>	<u>Value</u>
<u>Hydrogen Fuel Index (minimum, %) (1)</u>	<u>99.97</u>
<u>Total Gases (maximum, ppm v/v) (2)</u>	<u>300</u>
<u>Water (maximum, ppm v/v)</u>	<u>5</u>
<u>Total Hydrocarbons (maximum, ppm v/v) (3)</u>	<u>2</u>
<u>Oxygen (maximum, ppm v/v)</u>	<u>5</u>
<u>Helium (maximum, ppm v/v)</u>	<u>300</u>
<u>Nitrogen and Argon (maximum, ppm v/v)</u>	<u>100</u>
<u>Carbon dioxide (maximum, ppm v/v)</u>	<u>2</u>
<u>Carbon monoxide (maximum, ppm v/v)</u>	<u>0.2</u>
<u>Total Sulfur Compounds (maximum, ppm v/v)</u>	<u>0.004</u>

Formaldehyde (maximum, ppm v/v)	<u>0.01</u>
Formic acid (maximum, ppm v/v)	<u>0.2</u>
Ammonia (maximum, ppm v/v)	<u>0.1</u>
Total Halogenated Compounds (maximum, ppm v/v)	<u>0.05</u>
Particulates Size (maximum, $\mu\text{m}$ )	<u>10</u>
Particulate Concentration (maximum, $\mu\text{g/L @ NTP}$ )(4)	<u>1</u>
<ol style="list-style-type: none"> <li>1. <u>The hydrogen fuel index is the value obtained with the value of total gases (%) subtracted from 100%</u></li> <li>2. <u>Total Gases = Sum of all impurities listed on the table except particulates</u></li> <li>3. <u>Total Hydrocarbons may exceed 2 ppm v/v only due to the presence of methane, provided that the total gases do not exceed 300 ppm v/v.</u></li> <li>4. <u><math>\mu\text{g/L @ NTP}</math> = micrograms per liter of hydrogen fuel at 0°C and 1 atmosphere pressure.</u></li> </ol>	

This specification is an interim standard for hydrogen fuel. Once an American National Standards Institute (ANSI) accredited standards writing organization has adopted a hydrogen fuel standard, the Department of Food and Agriculture (Department) is required by law to formally adopt that standard by reference.

Test procedures have not yet been finalized to measure the properties specified in this interim standard.—The Department of Food and Agriculture will formally adopt interim sampling and test procedures by regulation as they are developed by the Department or by an ANSI accredited standards writing organization. The Department of Food and Agriculture will begin enforcement of this section once sampling and test procedures have been adopted by regulation.

NOTE: Authority cited: Sections 12027 and 13446, Business and Professions Code. Reference: Sections 13401(c), 13401(h), 13401(i), 13401(m), 13401(r), 13413(a) 13595(a), Business and Professions Code.