

JAPAN GRADE - CRUDE BEVERAGE / INDUSTRIAL ETHANOL SPECIFICATION
(2011 / 2012 Season)

<u>Parameter</u>	<u>Units</u>	<u>Limits</u>	<u>Method</u>
Alcohol Strength at 15°C	% Vol.	Min. 95.5	ASTM D 4052
Alcohol Strength at 20°C	% Mass	Min. 93.2	ASTM D 4052
Aldehydes (as Acetaldehyde)	Mg/100 ml	Max. 5.0	GLC
Acidity (as Acetic Acid)	Mg/100 ml	Max. 3.0	ASTM D1613
Appearance	-	Clear ⁽¹⁾	Visual
Benzene	ppm	Absent ⁽²⁾	UV/GLC
Chloride	ppm	Absent ⁽⁴⁾	Turbidimetric
Crotonaldehyde	Mg/100 ml	Absent ⁽³⁾	GLC / ASTM D 5501
Cyclohexane	ppm	Absent ⁽²⁾	GLC / ASTM D 5501
Hydrocarbons	% vol.	Absent ⁽⁶⁾	ASTM D 1722
Dry Extracts	Mg/100 ml	Max. 1.5	ASTM D 1353
Esters (as Ethyl Acetate)	Mg/100 ml	Max. 6.0	GLC
I-Propanol	Mg/100 ml	Max. 1.0	GLC
Higher Alcohols (I-Propanol, N-Propanol, I-Butanol, N-Butanol, I-Amyl)	Mg/100 ml	Max. 10	GLC
Methanol	Mg/100 ml	Max. 5.0	GLC
Permanganate time at 20°C	Minutes	Min. 6	ASTM D 1363
Alkalinity		Negative	ASTM D 1614
Xylene	ppm	Negative ⁽²⁾	UV/GLC
Toluene	ppm	Negative ⁽²⁾	ASTM D 5580
Acetal	Mg/100 ml	Max. 10	GLC
Color	Pt-Co	Max. 5	ASTM D 1209
MEG	Mg/L	Max. 1.0	GLC
DEG	Mg/L	Max. 1.0	GLC
1,4 Dioxane	Mg/L	<0.01 ⁽⁵⁾	GLC/MS

- (1) Clear and free of suspended matter
 (2) Detection limit of test method: 0.1 ppm
 (3) Detection limit of test method: 0.5 ppm
 (4) Detection limit of test method: 1.0 ppm
 (5) Detection limit of test method: 0.01 Mg/L
 (6) Detection limit of test method – ASTM D 1722