

**I T E C**  
*Refining and Marketing Company Ltd.*



**JAPAN GRADE - CRUDE BEVERAGE / INDUSTRIAL ETHANOL SPECIFICATION**  
(2010/2011 Season)

SPECIFICATION	UNITS	LIMITS	METHOD
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 <sup>(1)</sup>	Visual
Benzene	ppm	Absent <sup>(2)</sup>	UV/GLC
Chloride	ppm	Absent <sup>(4)</sup>	Turbidimetric
Crotonaldehyde	Mg/100 ml	Absent <sup>(3)</sup>	GLC / ASTM D 5501
Cyclohexane	ppm	Absent <sup>(2)</sup>	GLC / ASTM D 5501
Hydrocarbons	% vol.	Absent <sup>(6)</sup>	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 <sup>(2)</sup>	UV/GLC
Toluene	ppm	Negative <sup>(2)</sup>	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 <sup>(5)</sup>	GLC/MS

<sup>(1)</sup> Clear and free of suspended matter

<sup>(2)</sup> Detection limit of test method: 0.1 ppm

<sup>(3)</sup> Detection limit of test method: 0.5 ppm

<sup>(4)</sup> Detection limit of test method: 1.0 ppm

<sup>(5)</sup> Detection limit of test method: 0.01 Mg/L

<sup>(6)</sup> Detection limit of test method - ASTM D 1722