

## CERTIFICATE OF ANALYSIS

PRODUCT NAME : Ethyl alcohol, absolute

GRADE : GR

CAS NO. : [64-17-5]

LOT NO. : E3179ME

Molecular formula : C<sub>2</sub>H<sub>5</sub>OH

CATALOG NO. : 49.63.3017

Store Temperature : 1~30°C

TEST ITEM	SPECIFICATION	TEST RESULT
Assay	above 99.5 %	99.9 %
Specific gravity(20/20°C)	below 0.793	0.790
Moisture	below 0.1 %	0.056 %
Non-volatile matters	below 0.001 %	below 0.001 %
Acid	below 0.002 %	below 0.002 %
Alkali	below 0.0001 %	below 0.0001 %
Heavy maetals(as Pb)	below 0.0001 %	below 0.0001 %
Aldehyde & ketone	below 0.001 %	below 0.001 %
Fusel oil(as C <sub>5</sub> H <sub>12</sub> O)	below 0.004 %	below 0.004 %
Methanol	below 0.01 %	below 0.01 %
Benzene&other organic impurities	passes test	passes test
Substance reducing permanganate	passes test	passes test
Substance darkened by sulfuric acid	passes test	passes test
<b>Appearance :</b> clear liquid		<b><u>PASSES TEST</u></b>
<b>Identification :</b> To 5ml of a solution(1 in 10) add 1ml of 1N NaOH, then add 2ml of 0.1N iodine: the odor of iodoform develops, and a yellow precipitate is formed within 30 minutes.		<b><u>PASSES TEST</u></b>
<b>Melting point :</b> -114 °C	<b>Boiling point :</b> 78.5 °C	

Test Method : JIS K 8101

Test Date : May 21, 2012

Tested by : Cha Hae Kyung



Conclusion : PASS

Delivery Date : Jun 05, 2012

Certified by : Lee Woo Young

