



RAYONG LABORATORY ADDRESS :

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**CERTIFICATION OF ANALYSIS  
( RAW GAS - CO2 SPECIFICATIONS )**

**REPORT DESCRIPTION :**

REPORT No. :	REPORT DATE :
ANALYSIS No. :	ANALYSIS DATE :
SERVICE ORDER AGREEMENT No. :	SAMPLE RECEIVED DATE :
EXPORT INVOICE No. or PO No. / DATE:	ANALYSIS BY :

**CUSTOMER DESCRIPTION :**

CUSTOMER NAME :
CUSTOMER ADDRESS :
TEL. No. / FAX. No. :
Attn. to :

**SAMPLE DESCRIPTION (By Customer) :**

SAMPLE TYPE :	SAMPLING RECEIVED IN
SAMPLE POINT / LOCATION :	- Cylinder No. :
SAMPLING DATE :	- Sampling Kit : Small Cylinder no
SAMPLING TIME :	Beaker no. :
SAMPLING BY :	Sampling Bags no. :

**ANALYSIS DESCRIPTION :**

TEST PARAMETER	UNIT	TEST METHOD	ISBT Reference no.	TEST RESULT	DL	SPECIFICATION
CO2 Purity (Assay)*	% v/v	Balance	-	-	-	-
Moisture Content / Water (H2O)*	ppm v/v	Detector Tube	-	0.1	-	-
Oxygen (O2)*	ppm v/v	Gas chromatography	ISBT 4.0	1.0	-	-
Nitrogen (N2)*	ppm v/v	Gas chromatography	-	0.02	-	-
Carbon Monoxide (CO)*	ppm v/v	Gas chromatography	ISBT 5.0	0.02	-	-
Argon (Ar)*	ppm v/v	Gas chromatography	-	1.0	-	-
Hydrogen (H2)*	ppm v/v	Gas chromatography	-	1.0	-	-
Ammonia (NH3)*	ppm v/v	Detector Tube	ISBT 6.0	0.2	-	-
Oxides of Nitrogen (NOx)*	ppm v/v	Detector Tube	ISBT 7.0	0.01	-	-
Nitrogen Dioxide (NO2)*	ppm v/v	Detector Tube	ISBT 7.1	0.1	-	-
Nitric Oxide (NO)*	ppm v/v	Detector Tube	ISBT 7.2	0.1	-	-
Hydrogen Cyanide (HCN)*	ppm v/v	Detector Tube	ISBT 17.0	0.1	-	-
Phosphine (PH3)*	ppm v/v	Detector Tube	ISBT 19.0	0.02	-	-
Total volatile Hydrocarbon (THC) (as CH4)*	ppm v/v	Gas chromatography	ISBT 10.0	0.15	-	-
Methane	ppm v/v	Inhouse method <sup>1</sup>	-	0.15	-	-
Ethane	ppm v/v	Inhouse method <sup>1</sup>	-	0.15	-	-
Ethylene	ppm v/v	Inhouse method <sup>1</sup>	-	0.15	-	-
Propane	ppm v/v	Inhouse method <sup>1</sup>	-	0.15	-	-
Propylene	ppm v/v	Inhouse method <sup>1</sup>	-	0.15	-	-
Isobutane	ppm v/v	Inhouse method <sup>1</sup>	-	0.15	-	-
n-butane	ppm v/v	Inhouse method <sup>1</sup>	-	0.15	-	-
Isopentane	ppm v/v	Inhouse method <sup>1</sup>	-	0.15	-	-
n-pentane	ppm v/v	Inhouse method <sup>1</sup>	-	0.15	-	-
Hexane plus	ppm v/v	Inhouse method <sup>1</sup>	-	0.15	-	-
Total Non-Methane Hydrocarbons*	ppm v/v	Gas chromatography	ISBT 10.1	0.15	-	-
Acetaldehyde (C2H4O, or AA)	ppm v/v	Inhouse method <sup>5</sup>	ISBT 11.0	0.1	-	-
Dimethyl Ether*	ppm v/v	Gas chromatography	ISBT 11.0	0.1	-	-
Methanol*	ppm v/v	Gas chromatography	ISBT 11.0	0.1	-	-
Ethanol*	ppm v/v	Gas chromatography	ISBT 11.0	0.1	-	-
Acetone*	ppm v/v	Gas chromatography	ISBT 11.0	0.1	-	-
Propionaldehyde*	ppm v/v	Gas chromatography	ISBT 11.0	0.1	-	-
Isopropanol*	ppm v/v	Gas chromatography	ISBT 11.0	0.1	-	-
n-Propanol*	ppm v/v	Gas chromatography	ISBT 11.0	0.1	-	-
t-Butanol*	ppm v/v	Gas chromatography	ISBT 11.0	0.1	-	-
Ethyl Acetate*	ppm v/v	Gas chromatography	ISBT 11.0	0.1	-	-
2-Butanol	ppm v/v	Gas chromatography	ISBT 11.0	0.1	-	-
Isobutanol*	ppm v/v	Gas chromatography	ISBT 11.0	0.1	-	-
n-Butanol*	ppm v/v	Gas chromatography	ISBT 11.0	0.1	-	-
Isoamyl Acetate*	ppm v/v	Gas chromatography	ISBT 11.0	0.1	-	-
Ethylene Oxide (EO)*	ppm v/v	Gas chromatography	ISBT 20.0	0.1	-	-
Vinyl Chloride*	ppm v/v	Gas chromatography	ISBT 18.0	0.1	-	-
Benzene*	ppm v/v	Inhouse method <sup>3</sup>	ISBT 12.0	0.005	-	-
Toluene*	ppm v/v	Gas chromatography	ISBT 12.0	0.005	-	-
Ethyl benzene*	ppm v/v	Gas chromatography	ISBT 12.0	0.005	-	-
m-xylene*	ppm v/v	Gas chromatography	ISBT 12.0	0.005	-	-
p-xylene*	ppm v/v	Gas chromatography	ISBT 12.0	0.005	-	-
o-xylene*	ppm v/v	Gas chromatography	ISBT 12.0	0.005	-	-
Total Sulfur (as S) (Excluding Sulfur Dioxide)*	ppm v/v	Gas chromatography	ISBT 13.0	0.05	-	-
Sulfur Dioxide (SO2)*	ppm v/v	Gas chromatography	ISBT 14.0	0.05	-	-

TEST PARAMETER	UNIT	TEST METHOD	ISBT Reference no.	TEST RESULT	DL	SPECIFICATION
Hydrogen Sulfide	ppm v/v	Inhouse method <sup>4</sup>	ISBT 13.0		0.05	-
Carbonyl Sulfide	ppm v/v	Inhouse method <sup>4</sup>	ISBT 13.0		0.05	-
Dimethyl Disulfide	ppm v/v	Inhouse method <sup>4</sup>	ISBT 13.0		0.05	-
Methyl Mercaptan*	ppm v/v	Gas chromatography	ISBT 13.0		0.05	-
Ethyl Mercaptan*	ppm v/v	Gas chromatography	ISBT 13.0		0.05	-
Dimethyl Sulfide*	ppm v/v	Gas chromatography	ISBT 13.0		0.05	-
Carbon Disulfide*	ppm v/v	Gas chromatography	ISBT 13.0		0.05	-
Isopropyl Mercaptan*	ppm v/v	Gas chromatography	ISBT 13.0		0.05	-
n-propyl Mercaptan*	ppm v/v	Gas chromatography	ISBT 13.0		0.05	-
Isobutyl Mercaptan*	ppm v/v	Gas chromatography	ISBT 13.0		0.05	-
n-butyl Mercaptan*	ppm v/v	Gas chromatography	ISBT 13.0		0.05	-
t-butyl Mercaptan*	ppm v/v	Gas chromatography	ISBT 13.0		0.05	-
Sec-Butyl Mercaptan*	ppm v/v	Gas chromatography	ISBT 13.0		0.05	-
Methyl Ethyl Sulfide*	ppm v/v	Gas chromatography	ISBT 13.0		0.05	-
Diethyl Sulfide*	ppm v/v	Gas chromatography	ISBT 13.0		0.05	-

Note :

- (1) Inhouse method WI-LAB08 based on International Society of Beverage Technologists (ISBT)- 4<sup>th</sup> Revision, 01 Oct 2021, Procedure 10.0
- (2) Inhouse method WI-LAB06 based on ASTM D8098-17.
- (3) Inhouse method WI-LAB03 & WI-LAB07 based on International Society of Beverage Technologists (ISBT)- 4<sup>th</sup> Revision, 01 Oct 2021, Procedure 12.0
- (4) Inhouse method WI-LAB04 based on International Society of Beverage Technologists (ISBT)- 4<sup>th</sup> Revision, 01 Oct 2021, Procedure 13.0
- (5) Inhouse method WI-LAB05 based on International Society of Beverage Technologists (ISBT)- 4<sup>th</sup> Revision, 01 Oct 2021, Procedure 11.0

(\* Test marked "Not TISI Accredited" in this certificate are not included in the TISI Accreditation Schedule for our laboratory.  
- The reported uncertainty is an expanded uncertainty calculated using a coverage factor of k=2 which gives a level of confidence of approximately 95%  
DL = Detection Limit. nd = less than the detection Limit. ppm = parts per million. ppb = parts per billion. na = not available.

Review by :

(Thatchayaphan Thongmuengluang)

Approved by :

(Tippawan Pichetjumsuscheep)

Remark :

- Partial duplication of this certificate without documentary permission from Laboratory is prohibited.
- This certificate is valid only for the test and mentioned sample(s).
- The laboratory disclaims responsibility for The information is supplied by the customer and can affect the validity of results.
- The certificate that the results apply to the sample as received.
- The laboratory does not have a policy to reporting opinions , interpretations and statements of conformity.
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