



CERTIFICATION OF ANALYSIS
(ISBT-CO2 BEVERAGE GRADE 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	Zahm & Nagel	ISBT 2.0		99.00	Min. 99.90
Moisture Content / Water (H2O)*	ppm v/v	Moisture Analyzer	ISBT 3.0		0.25	Max. 20.0
Oxygen (O2)	ppm v/v	Inhouse method ²	ISBT 4.0		0.7	Max. 30.0
Carbon Monoxide (CO)	ppm v/v	Inhouse method ²	ISBT 5.0		0.5	Max. 10.0
Acetaldehyde (C2H4O, or AA)	ppm v/v	Inhouse method ⁵	ISBT 11.0		0.1	Max. 0.2
Methanol (CH3OH)*	ppm v/v	Gas chromatography	ISBT 9.0		0.1	Max. 10.0
Ethylene Oxide*	ppm v/v	Gas chromatography	ISBT 20.0		0.1	Not Detectable
Vinyl Chloride*	ppm v/v	Gas chromatography	ISBT 18.0		0.1	Not Detectable
Aromatic Hydrocarbon (Benzene)	ppb v/v	Inhouse method ³	ISBT 12.0		5.0	Max. 20.0
Ammonia (NH3)*	ppm v/v	Detector Tube	ISBT 6.0		0.2	Max. 2.5
Oxides of Nitrogen (NOx)*	ppm v/v	Detector Tube	ISBT 7.0		0.01	Max. 5.0
Nitrogen Dioxide (NO2)*	ppm v/v	Detector Tube	ISBT 7.1		0.1	Max. 2.5
Nitric Oxide (NO)*	ppm v/v	Detector Tube	ISBT 7.2		0.1	Max. 2.5
Phosphine*	ppm v/v	Detector Tube	ISBT 19.0		0.02	Max. 0.3
Hydrogen Cyanide*	ppm v/v	Detector Tube	ISBT 17.0		0.1	Not Detectable
Non-Volatile Residue (NVR)*	ppm w/w	Gravimetry	ISBT 8.0		1.5	Max. 10.0
Non-Volatile Organic Residue (NVOR)*	ppm w/w	Gravimetry	ISBT 8.0		1.5	Max. 5.0
Total Hydrocarbon (THC)(as CH4)*	ppm v/v	Gas chromatography	ISBT 10.0		0.15	Max. 50.0
Methane	ppm v/v	Inhouse method ¹	-		0.15	-
Ethane	ppm v/v	Inhouse method ¹	-		0.15	-
Propane	ppm v/v	Inhouse method ¹	-		0.15	-
Butane	ppm v/v	Inhouse method ¹	-		0.15	-
Pentane	ppm v/v	Inhouse method ¹	-		0.15	-
Hexane plus	ppm v/v	Inhouse method ¹	-		0.15	-
Total Non-Methane Hydrocarbon (as CH4)*	ppm v/v	Gas chromatography	ISBT 10.1		0.15	Max. 20.0
Total Sulfur - (TS) (Excluding Sulfur Dioxide)*	ppm v/v	Gas chromatography	ISBT 13.0		0.05	Max. 0.1
Sulfur Dioxide (SO2)*	ppm v/v	Gas chromatography	ISBT 14.0		0.05	Max. 1.0
Carbonyl Sulfide	ppm v/v	Inhouse method ⁴	ISBT 13.0		0.05	na
Hydrogen Sulfide	ppm v/v	Inhouse method ⁴	ISBT 13.0		0.05	na
C1-C4 Mercaptans, Sulfides, Disulfides*	ppm v/v	Gas chromatography	ISBT 13.0		0.05	na
Odor of Solid CO2 (Snow)*	-	Organoleptic	ISBT 15.0		na	No Foreign Odor
Appearance of Solid CO2 (Snow)*	-	Organoleptic	ISBT 15.0		na	No Foreign appearance
Odor & Taste in Water*	-	Organoleptic	ISBT 16.0		na	No Foreign Odor or Taste
Appearance of Water*	-	Organoleptic	ISBT 16.0		na	No Color or Turbidity

Note :
 (1) Inhouse method WI-LAB08 based on International Society of Beverage Technologists (ISBT)- 4th 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)- 4th Revision, 01 Oct 2021, Procedure 12.0
 (4) Inhouse method WI-LAB04 based on International Society of Beverage Technologists (ISBT)- 4th Revision, 01 Oct 2021, Procedure 13.0
 (5) Inhouse method WI-LAB05 based on International Society of Beverage Technologists (ISBT)- 4th 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 Pichetjumscheep)

Remark :
 - Partial duplication of this certificate without documentary permission from Laboratory is prohibited.
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 - The certificate that the results apply to the sample as received.
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 - The laboratory disclaims in the report indicating which results may be affected by the deviation.