



SCHEDULE OF ACCREDITATION

Testing Laboratory Number: **LAS-002**

<p><u>Permanent Address of Laboratory:</u> Angostura Limited Corner Eastern Main Road & Trinity Avenue Laventille Trinidad and Tobago. W.I.</p> <p><u>Postal Address</u> Corner Eastern Main Road & Trinity Avenue Laventille Trinidad and Tobago. W.I.</p> <p>Tel : 868-623-1841 Fax : 868-623-1847/624-8531 e-mail: cghomer@angostura.com</p>	<p><u>Management Signatories:</u> Carol Homer-Caesar</p> <p><u>Technical Signatories:</u> Ann-Marie O'Brien William Jordan</p> <p><u>Nominated Representative:</u> Carol Homer-Caesar</p> <p><u>Certificate of Accreditation</u> Issue No. : 7 Date of issue : 27th Feb 2019 Date of expiry : 29th Dec 2019</p>	
Materials/Products Tested	Types of Tests/Properties Measured, Range of Measurement	Standard Specifications, Equipment/Techniques Used
<p><u>CHEMICAL</u> Alcoholic beverages – Rum, bitters, flavoured alcoholic products, wines, carbonated beverages</p>	<p>1) Determination of ethanol content (%) by Macro Distillation method using OIML system</p>	<p>Reference – AOAC 18th Ed. 26.1.08 & 26.2.04 (Alcohol by volume in Distilled Liquors – Hydrometer method) Method No. LA-TM-DIST-01</p>
<p>Alcoholic beverages – Rum, bitters, flavoured alcoholic products, wines, carbonated beverages</p>	<p>2) Determination of ethanol content (%) by Micro Distillation using Dee Distillation and Density Meter Analyser</p>	<p>Reference – DMA 4500/5000 Manual; Dee Distillation – Instruction Manual 60.50.131 5th issue Method No. LA-TM-DEE-01 and LA-TM-DMA-01</p>
<p>Alcoholic beverages – Rum, bitters, flavoured alcoholic products, wines, carbonated beverages</p>	<p>3) Determination of Total Solids by Evaporation method Units: g/100 mL, g/L</p>	<p>Reference – AOAC 18th Ed. 33.2.09 Method No. LA-TM-TS-01</p>
<p>Alcoholic beverages – Rum, bitters, flavoured alcoholic products, wines, carbonated beverages</p>	<p>4) Determination of Total Acids by Titrimetric method Units: mg/100 mL</p>	<p>Reference – AOAC 18th Ed. Official method 945.08 (Part A) Method No. LA-TM-TITR-03</p>

Alcoholic beverages – Rum, bitters, flavoured alcoholic products, wines, carbonated beverages	5) Determination of Fixed Acids by Titrimetric method Units: mg/100 mL	Reference – AOAC 18 th Ed. Official Method 945.08 (Part B) Method No. LA-TM-TITR-04
Alcoholic beverages – Rum, bitters, flavoured alcoholic products, wines, carbonated beverages	6) Determination of pH	Reference – AOAC 18 th Ed. 10.041 Method No. LA-TM-pH-01ML
Alcoholic beverages – Rum, bitters, flavoured alcoholic products, wines, carbonated beverages	7) Determination of pH	Reference – AOAC 18 th Ed. 973.41 Method No. LA-TM-pH-03DL
Alcoholic beverages – Rum, bitters, flavoured alcoholic products, wines, carbonated beverages	8) Determination of Acetaldehyde, Methanol, Acetone, Methyl acetate, Ethyl format, Ethyl acetate, <i>n</i> -Propanol, <i>s</i> -Butanol, <i>iso</i> -Butanol, <i>n</i> -Butanol, Acetal, active Amyl alcohol, <i>iso</i> -Amyl alcohol, <i>n</i> -Amyl alcohol and Furfuraldehyde by Gas Chromatography Units: mg/100 mL <i>Range: 0.6 – 5,000 mg/100 mL Esters (Methyl acetate, Ethyl formate and Ethyl acetate)</i> <i>Range: 0.2 – 18,500 mg/100 mL Fusel oils (High boiling point alcohols)</i>	All 15 components are analysed as one run by Gas Chromatography using Flame Ionisation detection. Ref: Bacardi Method– BAP #275F – Agilent Technologies 6890N Operator’s Manual Method No. LA-TM-CON-02ML
Alcoholic beverages – Rum, bitters, flavoured alcoholic products, wines, carbonated beverages	9) Determination of Acetaldehyde, Methanol, Acetone, Methyl acetate, Ethyl format, Ethyl acetate, <i>n</i> -Propanol, <i>s</i> -Butanol, <i>iso</i> -Butanol, <i>n</i> -Butanol, Acetal, active Amyl alcohol, <i>iso</i> -Amyl alcohol, <i>n</i> -Amyl alcohol and Furfuraldehyde by Gas Chromatography Units: mg/100 mL <i>Range: 0.6 – 5,000 mg/100 mL Esters (Methyl acetate, Ethyl formate and Ethyl acetate)</i> <i>Range: 0.2 – 18,500 mg/100 mL Fusel oils (High boiling point alcohols)</i>	All 15 components are analysed as one run by Gas Chromatography using Flame Ionisation detection. Ref: Bacardi Method– BAP #275F; Hewlett Packard 5890 series II & 5890A Operator’s Manual Method No. LA-IR-TM-CON-GC-02DL
Metal Ions in Solution – aqueous solution by inductively coupled plasma-atomic emission spectroscopy (ICP-OES Spectroscopy)	10) Determination of: <ul style="list-style-type: none"> • Iron: 0.003 – 3500 ppm • Magnesium: 0.002 - 3.500 ppm • Copper: 0.009 – 3.500 ppm • Potassium: 0.023 – 3.500 ppm • Sodium: 0.030 – 3.500 ppm • Calcium: 0.017 – 3.500 ppm 	Reference - Perkin Elmer Optima 2100 DV Online Operator's Manual Method No. LA-TM-IONS-02ML

Metal Ions in Solution – alcoholic solution (wine and distilled spirits) by inductively coupled plasma-atomic emission spectroscopy (ICP-OES Spectroscopy)	<p>Determination of:</p> <ul style="list-style-type: none"> • Calcium: 0.010 – 6.000 ppm • Magnesium: 0.003 – 6.000 ppm • Potassium: 0.004 – 6.000 ppm • Copper: 0.003 – 6.000 ppm • Iron: 0.026 – 6.000 ppm • Sodium: 0.024 – 6.000 ppm 	<p>Reference - Perkin Elmer Optima 2100 DV Online Operator's Manual</p> <p>Method No. LA-TM-IONS-02ML</p>
Alcoholic beverages – Rum, bitters, flavoured alcoholic products, wines, carbonated beverages	<p>11) Determination of ethanol content (%) by AlcoLyzer (Near Infra-Red technology)</p>	<p>Reference – Instruction Manual AlcoLyzer M Beer/Spirits/Wine/Sake</p> <p>Method No. LA-TM-LYZR-01</p>
Water, Wastewater	<p>12) Determination of Chemical Oxygen Demand</p> <p><i>Range: 25 -1000mg/L</i></p>	<p>Reference - HACH Company TNTplus Mercury Free, Chemical Oxygen Demand</p> <p>Method No. LA-TM-COD-01ENV</p>
Water, Wastewater	<p>13) Determination of Total Phosphates in Liquid Effluent</p> <p><i>Range: 0.05 – 3.0 mg/L</i></p>	<p>Reference - Standard Method for the Examination of Water and Wastewater 21st Ed. 4500-P D</p> <p>Method No. LA-TM-PHOS-01ENV</p>
Water, Wastewater	<p>14) Determination of Ammoniacal Nitrogen in Liquid Effluent</p> <p><i>Range: 5 -100 mg/L</i></p>	<p>Reference - Standard Method for the Examination of Water and Wastewater 21st Ed. 4500-NH3 B C</p> <p>Method No. LA-TM-TITR-01ENV</p>
Water, Wastewater	<p>15) Determination of pH (Modified In-house Method)</p>	<p>Reference: Standard Method for the Examination of Water and Wastewater 21st Ed. 4500-H+ B. (Electrometric method); YSI Professional Plus User Manual</p> <p>Method No: LA-TM-pH-01ENV</p>

Date of accreditation: 1st November, 2007

Manager, TTLABS