

# ภาคผนวก ง

เอกสารการสอบเทียบเครื่องมือตรวจวิเคราะห์



รายการเครื่องใช้ขึ้นการวิเคราะห์ / หมายเหตุ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Ambient	Total Suspended Particulate	High Volume	BKCF50372	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	BKCF50363	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	BKCF50365	-	-	On site Calibration
Ambient	Total Suspended Particulate	Digital Balance	BKCE00004	10-Mar-21	10-Mar-22	12
Ambient	Particulate Matter (PM-10)	High Volume	BKCF51060	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	BKCF50374	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	BKCF50379	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	Digital Balance	BKCE00004	10-Mar-21	10-Mar-22	12
Ambient	Nitrogen Dioxide	NO <sub>x</sub> Analyzer	BKCF50803	4-Jan-22	4-Jul-22	6
Ambient	Nitrogen Dioxide	NO <sub>x</sub> Analyzer	BKCF50785	4-Jan-22	4-Jul-22	6
Ambient	Nitrogen Dioxide	NO <sub>x</sub> Analyzer	BKCF50773	4-Jan-22	4-Jul-22	6
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	BKCF50977	1-Nov-21	2-May-23	18
Ambient	Wind Speed / Wind Direction	RYC FS0436	6-Jan-22	7-Jul-23	18	18
Ambient	Wind Speed / Wind Direction	BKCF50167	11-May-21	9-Nov-22	18	18
Stack	Carbon Monoxide	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Carbon Monoxide	Console Control Unit	BKCF50448	6-Jan-22	6-Jul-22	6
Stack	Carbon Monoxide	Pilot Tube	BKCF50463	6-Jan-22	6-Jul-22	6
Stack	Carbon Monoxide	CO Analyzer	BKCE00073	14-Oct-21	14-Apr-23	18
Stack	Chromium	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Chromium	ICP-OES	BKCE00037	13-Sep-21	12-Mar-23	18
Stack	Oxides of Nitrogen	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Oxides of Nitrogen	Console Control Unit	BKCF50448	6-Jan-22	6-Jul-22	6



รายการเครื่องใช้ขึ้นการวิเคราะห์ / หมายเหตุ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Workplace	Chromium	Field Rotameter	BKCF51013	1-Apr-22	1-Jul-22	3
Workplace	Chromium	ICP-OES	BKCF51037	13-Sep-21	12-Mar-23	18
Workplace	Silica (Quartz)	Field Rotameter	BKCF51022	5-Jan-22	5-Apr-22	3
Workplace	Silica (Quartz)	Field Rotameter	BKCF51013	1-Apr-22	1-Jul-22	3
Noise	Leq 24 hrs	Sound Calibrator	BKCF50617	9-Aug-21	9-Aug-22	12
Noise	Leq 24 hrs	Sound Level Meter	BKCF50879	25-Oct-21	25-Oct-22	12
Noise	Leq 24 hrs	Sound Level Meter	BKCF50927	7-Sep-22	7-Sep-22	12
Noise	Leq 24 hrs	Sound Level Meter	BKCF50923	12-Oct-21	12-Oct-22	12
Noise	Leq 24 hrs	Sound Level Meter	BKCF50926	7-Jul-21	7-Jul-22	12
Noise	Leq 24 hrs	Sound Calibrator	BKCF50617	9-Aug-21	9-Aug-22	12
Noise	Leq 24 hrs	Sound Level Meter	BKCF50880	25-Oct-21	25-Oct-22	12
Noise	Leq 8 hrs	Sound Calibrator	BKCF50630	24-Mar-21	24-Mar-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50993	12-Oct-21	12-Oct-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50994	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50995	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50996	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50998	7-Sep-21	7-Sep-22	12
Noise	Leq 8 hrs	Sound Calibrator	BKCF50617	9-Aug-21	9-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50996	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50970	12-Jan-22	12-Jan-23	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50971	12-Jan-22	12-Jan-23	12
Noise	Leq 8 hrs	Sound Calibrator	BKCF50617	9-Aug-21	9-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50968	12-Jan-22	12-Jan-23	12



รายการเครื่องใช้ขึ้นการวิเคราะห์ / หมายเหตุ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Stack	Oxides of Nitrogen	Pilot Tube	BKCF50453	6-Jan-22	6-Jul-22	6
Stack	Oxides of Nitrogen	Vacuum Gauge	BKCF50546	10-Nov-21	8-Nov-22	18
Stack	Oxides of Nitrogen	Vacuum Gauge	BKCF50545	23-Dec-20	23-Jun-22	18
Stack	Oxides of Nitrogen	Vacuum Gauge	BKCF50893	26-Nov-20	27-May-22	18
Stack	Oxides of Nitrogen	Spectrophotometer	BKCE00018	15-Oct-21	15-Oct-22	12
Stack	Total Hydrocarbon as Methane	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Total Hydrocarbon as Methane	Pilot Tube	BKCF50453	6-Jan-22	6-Jul-22	6
Stack	Total Hydrocarbon as Methane	FD Analyzer	BKCF50758	4-Jan-22	4-Jul-22	6
Stack	Total VOC as Methane	Pilot Tube	BKCF50463	6-Jan-22	6-Jul-22	6
Stack	Total VOC as Methane	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Total VOC as Methane	FD Analyzer	BKCF50758	4-Jan-22	4-Jul-22	6
Stack	Total Suspended Particulate	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Total Suspended Particulate	Console Control Unit	BKCF50448	6-Jan-22	6-Jul-22	6
Stack	Total Suspended Particulate	Pilot Tube	BKCF50463	6-Jan-22	6-Jul-22	6
Stack	Total Suspended Particulate	Digital Balance	BKCE00049	16-Dec-21	16-Dec-22	12
Workplace	Total Dust	Field Rotameter	BKCF51022	5-Jan-22	5-Apr-22	3
Workplace	Total Dust	Field Rotameter	BKCF51013	1-Apr-22	1-Jul-22	3
Workplace	Total Dust	Digital Balance	BKCE00004	25-Feb-22	25-Feb-23	12
Workplace	Respirable Dust	Field Rotameter	BKCF51022	5-Apr-22	5-Apr-22	3
Workplace	Respirable Dust	Field Rotameter	BKCF51013	1-Apr-22	1-Jul-22	3
Workplace	Respirable Dust	Digital Balance	BKCE00004	25-Feb-22	25-Feb-23	12
Workplace	Chromium	Field Rotameter	BKCF51022	5-Jan-22	5-Apr-22	3



รายการเครื่องใช้ขึ้นการวิเคราะห์ / หมายเหตุ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Noise	Leq 8 hrs	Sound Level Meter	BKCF50969	12-Jan-22	12-Jan-23	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50970	12-Jan-22	12-Jan-23	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50971	12-Jan-22	12-Jan-23	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50993	12-Oct-21	12-Oct-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50994	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50995	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Calibrator	BKCF50633	14-Jan-22	14-Jan-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50998	7-Sep-21	7-Sep-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50999	7-Sep-21	7-Sep-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF51000	7-Sep-21	7-Sep-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50650	12-May-21	12-May-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50673	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50682	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50650	12-May-21	12-May-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50669	7-Jun-21	7-Jun-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50673	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50681	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50682	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50662	17-May-21	17-May-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50680	15-Feb-22	15-Feb-23	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50681	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50662	17-May-21	17-May-22	12



รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ทดสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Water Lab	pH at 25 °C	pH meter	BKC_EH0072	26-Mar-21	24-Sep-22	18
Water Lab	Oil & Grease	Electronic Top-Loading Balance	BKC_EH0002	25-Feb-22	25-Feb-23	12
Water Lab	Oil & Grease	Water Bath	BKC_EH0148	31-Jan-22	1-Aug-23	18
Water Lab	Total Suspended Solids	Electronic Top-Loading Balance	BKC_EH0002	25-Feb-22	25-Feb-23	12
Water Lab	Total Suspended Solids	Oven	BKC_EH0007	1-Dec-21	1-Jun-23	18
Water Lab	Temperature	pH Meter	BKC_LG0024	25-Nov-21	25-Nov-22	12
Water Lab	BOD (5 days at 20°C)	DO Meter	BKC_EH0017	29-Dec-20	29-Jun-22	18
Water Lab	BOD (5 days at 20°C)	Incubator	BKC_EH0005	4-Oct-21	4-Apr-23	18
Water Lab	COD	Hot Block	BKC_EH0222	21-Mar-22	21-Mar-23	12
Water Lab	COD	Spectrophotometer	BKC_EH0018	15-Oct-21	15-Oct-22	12



รายการเครื่องใช้ขึ้นการวิเคราะห์ / หมายเหตุ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Ambient	Total Suspended Particulate	High Volume	BKCF50372	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	BKCF50363	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	BKCF50365	-	-	On site Calibration
Ambient	Total Suspended Particulate	Digital Balance	BKCE00004	10-Mar-21	10-Mar-22	12
Ambient	Particulate Matter (PM-10)	High Volume	BKCF51060	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	BKCF50374	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	BKCF50379	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	Digital Balance	BKCE00004	10-Mar-21	10-Mar-22	12
Ambient	Nitrogen Dioxide	NO <sub>x</sub> Analyzer	BKCF50803	4-Jan-22	4-Jul-22	6
Ambient	Nitrogen Dioxide	NO <sub>x</sub> Analyzer	BKCF50785	4-Jan-22	4-Jul-22	6
Ambient	Nitrogen Dioxide	NO <sub>x</sub> Analyzer	BKCF50773	4-Jan-22	4-Jul-22	6
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	BKCF50977	1-Nov-21	2-May-23	18
Ambient	Wind Speed / Wind Direction	RYC FS0436	6-Jan-22	7-Jul-23	18	18
Ambient	Wind Speed / Wind Direction	BKCF50167	11-May-21	9-Nov-22	18	18
Stack	Carbon Monoxide	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Carbon Monoxide	Console Control Unit	BKCF50448	6-Jan-22	6-Jul-22	6
Stack	Carbon Monoxide	Pilot Tube	BKCF50463	6-Jan-22	6-Jul-22	6
Stack	Carbon Monoxide	CO Analyzer	BKCE00073	14-Oct-21	14-Apr-23	18
Stack	Chromium	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Chromium	ICP-OES	BKCE00037	13-Sep-21	12-Mar-23	18
Stack	Oxides of Nitrogen	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Oxides of Nitrogen	Console Control Unit	BKCF50448	6-Jan-22	6-Jul-22	6



รายการเครื่องใช้ขึ้นการวิเคราะห์ / หมายเหตุ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Workplace	Chromium	Field Rotameter	BKCF51013	1-Apr-22	1-Jul-22	3
Workplace	Chromium	ICP-OES	BKCF51037	13-Sep-21	12-Mar-23	18
Workplace	Silica (Quartz)	Field Rotameter	BKCF51022	5-Jan-22	5-Apr-22	3
Workplace	Silica (Quartz)	Field Rotameter	BKCF51013	1-Apr-22	1-Jul-22	3
Noise	Leq 24 hrs	Sound Calibrator	BKCF50617	9-Aug-21	9-Aug-22	12
Noise	Leq 24 hrs	Sound Level Meter	BKCF50879	25-Oct-21	25-Oct-22	12
Noise	Leq 24 hrs	Sound Level Meter	BKCF50927	7-Sep-22	7-Sep-22	12
Noise	Leq 24 hrs	Sound Level Meter	BKCF50923	12-Oct-21	12-Oct-22	12
Noise	Leq 24 hrs	Sound Level Meter	BKCF50926	7-Jul-21	7-Jul-22	12
Noise	Leq 24 hrs	Sound Calibrator	BKCF50617	9-Aug-21	9-Aug-22	12
Noise	Leq 24 hrs	Sound Level Meter	BKCF50880	25-Oct-21	25-Oct-22	12
Noise	Leq 8 hrs	Sound Calibrator	BKCF50630	24-Mar-21	24-Mar-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50993	12-Oct-21	12-Oct-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50994	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50995	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50996	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50998	7-Sep-21	7-Sep-22	12
Noise	Leq 8 hrs	Sound Calibrator	BKCF50617	9-Aug-21	9-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50996	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50970	12-Jan-22	12-Jan-23	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50971	12-Jan-22	12-Jan-23	12
Noise	Leq 8 hrs	Sound Calibrator	BKCF50617	9-Aug-21	9-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50968	12-Jan-22	12-Jan-23	12



รายการเครื่องใช้ขึ้นการวิเคราะห์ / หมายเหตุ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Stack	Oxides of Nitrogen	Pilot Tube	BKCF50453	6-Jan-22	6-Jul-22	6
Stack	Oxides of Nitrogen	Vacuum Gauge	BKCF50546	8-Nov-21	8-Nov-22	18
Stack	Oxides of Nitrogen	Vacuum Gauge	BKCF50545	23-Jun-20	23-Jun-22	18
Stack	Oxides of Nitrogen	Vacuum Gauge	BKCF50893	26-Nov-20	27-May-22	18
Stack	Oxides of Nitrogen	Spectrophotometer	BKCE00018	15-Oct-21	15-Oct-22	12
Stack	Total Hydrocarbon as Methane	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Total Hydrocarbon as Methane	Pilot Tube	BKCF50453	6-Jan-22	6-Jul-22	6
Stack	Total Hydrocarbon as Methane	FD Analyzer	BKCF50758	4-Jan-22	4-Jul-22	6
Stack	Total VOC as Methane	Pilot Tube	BKCF50453	6-Jan-22	6-Jul-22	6
Stack	Total VOC as Methane	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Total VOC as Methane	FD Analyzer	BKCF50758	4-Jan-22	4-Jul-22	6
Stack	Total Suspended Particulate	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Total Suspended Particulate	Console Control Unit	BKCF50448	6-Jan-22	6-Jul-22	6
Stack	Total Suspended Particulate	Pilot Tube	BKCF50463	6-Jan-22	6-Jul-22	6
Stack	Total Suspended Particulate	Digital Balance	BKCE00049	16-Dec-21	16-Dec-22	12
Workplace	Total Dust	Field Rotameter	BKCF51022	5-Jan-22	5-Apr-22	3
Workplace	Total Dust	Field Rotameter	BKCF51013	1-Apr-22	1-Jul-22	3
Workplace	Total Dust	Digital Balance	BKCE00004	25-Feb-22	25-Feb-23	12
Workplace	Respirable Dust	Field Rotameter	BKCF51022	5-Apr-22	5-Apr-22	3
Workplace	Respirable Dust	Field Rotameter	BKCF51013	1-Apr-22	1-Jul-22	3
Workplace	Respirable Dust	Digital Balance	BKCE00004	25-Feb-22	25-Feb-23	12
Workplace	Chromium	Field Rotameter	BKCF51022	5-Jan-22	5-Apr-22	3



รายการเครื่องใช้ขึ้นการวิเคราะห์ / หมายเหตุ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Noise	Leq 8 hrs	Sound Level Meter	BKCF50969	12-Jan-22	12-Jan-23	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50970	12-Jan-22	12-Jan-23	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50971	12-Jan-22	12-Jan-23	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50993	12-Oct-21	12-Oct-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50994	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50995	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Calibrator	BKCF50633	14-Jan-22	14-Jan-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50998	7-Sep-21	7-Sep-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50999	7-Sep-21	7-Sep-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF51000	7-Sep-21	7-Sep-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50650	12-May-21	12-May-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50673	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50682	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50650	12-May-21	12-May-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50669	7-Jun-21	7-Jun-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50673	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50681	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50682	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50662	17-May-21	17-May-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50680	15-Feb-22	15-Feb-23	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50681	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50662	17-May-21	17-May-22	12



รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ทดสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Water Lab	pH at 25 °C	pH meter	BKC_EH0072	26-Mar-21	24-Sep-22	18
Water Lab	Oil & Grease	Electronic Top-Loading Balance	BKC_EH0002	25-Feb-22	25-Feb-23	12
Water Lab	Oil & Grease	Water Bath	BKC_EH0148	31-Jan-22	1-Aug-23	18
Water Lab	Total Suspended Solids	Electronic Top-Loading Balance	BKC_EH0002	25-Feb-22	25-Feb-23	12
Water Lab	Total Suspended Solids	Oven	BKC_EH0007	1-Dec-21	1-Jun-23	18
Water Lab	Temperature	pH Meter	BKC_LG0024	25-Nov-21	25-Nov-22	12
Water Lab	BOD (5 days at 20°C)	DO Meter	BKC_EH0017	29-Dec-20	29-Jun-22	18
Water Lab	BOD (5 days at 20°C)	Incubator	BKC_EH0005	4-Oct-21	4-Apr-23	18
Water Lab	COD	Hot Block	BKC_EH0222	21-Mar-22	21-Mar-23	12
Water Lab	COD	Spectrophotometer	BKC_EH0018	15-Oct-21	15-Oct-22	12

 <b>SARTORIUS</b> REFERENCE: <i>Sartorius</i> APPROVED BY: <i>L. AL</i> EFFECTIVE DATE: <i>10/15/18</i>		<b>of Calibration</b>	
Certificate No.: 21832084 Issue Date: Friday, March 31, 2018 Reference No.: 101011 Page No.: 1 of 3		Customer Name: <i>US Laboratory Group (Thailand) Co., Ltd.</i> 104 Petchburi Road (Thailand) Co., Ltd. 104 Petchburi Road (Thailand) Co., Ltd. Chomeng Sam Lueang, Khwaeng Sam Lueang, Bangkok 10330	
Master Number: <i>XP10500</i> Division: <i>Semi-micro Balance</i> Identification Number: <i>112081084</i> Address: <i>Thailand</i>		Calibration Place: <i>Lab Room</i> Calibration By: <i>Ms. Chuchalee Jitkarn</i> Calibration Date: <i>Wednesday, March 14, 2018</i>	
Measuring Unit: <i>g</i> Capacity: <i>31120</i> Repeatability: <i>0.0151</i> Accuracy: <i>mg</i>		Recount for calibration: <input type="checkbox"/> No Conditions <input checked="" type="checkbox"/> Serial Number <input type="checkbox"/> No conditions / Serial number	
Measurement Method: <i>UKAS Publication Ref Lab 14</i>		The measurement uncertainty stated is the expanded value which is obtained from the general uncertainty published by the company (document 001-001) and is based on the measurement uncertainty of the instrument. The measurement uncertainty is based on the measurement uncertainty of the instrument. The measurement uncertainty is based on the measurement uncertainty of the instrument.	
Recalibration: <i>1 year</i> Recalibration: <i>1 year</i> Recalibration: <i>1 year</i>		Recalibration: <i>1 year</i> Recalibration: <i>1 year</i> Recalibration: <i>1 year</i>	

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 Melaka 77100, Malaysia  
 Tel: +60 601 8018-1 Fax: +60 601 8018-2 E-mail: sarco@malaysia.sartorius.com

SARTORIUS

# Certificate

## of Calibration

Model Number : **XP10SDU**  
 Description : **Semi-annual Balance**  
 Serial Number : **1123091884**  
 Manufacturer : **Mettler Toledo**

Certificate No. : **21B20084**  
 Issued Date : **Friday, March 12, 2021**  
 Reference No. : **201811**  
 Page No. : **2 of 3**

### Calibration Results : Without Adjustment

#### Repeatability

The repeatability is a study of a weighing instrument's display under identical conditions under the same load. The repeatability is a measure of the weighing instrument's ability to produce the same reading when the same load is placed on the weighing pan at the same time. The standard deviation is used to assess repeatability.

Normal Value : [Empty Load]

2, 0.0002

20, 0.0001

20, 0.00032

20, 0.0001

20, 0.0001

20, 0.0001

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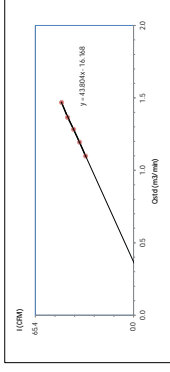
[illegible]



High Volume Air Sampler Calibration Worksheet

Project Site :	Magnesium Co. Ltd.	Barometric Pressure (mm Hg) :	759
Calibrate Location :	Spenthu (A3)	Temperature (°C) :	33
Calibrate Date :	14-Jun-22	High Volume ID :	BK6-F50379
Calibration Sheet No. :	C-140122-BK6-F50379	High Volume Model :	TE-5009X
Calibrator ID :	BK6-F50524	High Volume S/N :	1158
Calibrator Model :	TE-5020A	Calibrator Slope :	1.6462
Calibrator S/N :	2584	Calibrator Intercept :	-0.02902

Test No.	Delta (C) (ppm)	Q <sub>std</sub> (ppm)	1 Chart (ppm)	Linear Regression
1	3.2	1.0986	32	Slope: 43.8042
2	3.8	1.1945	36	Intercept: -1.61975
3	4.4	1.2832	40	Correlation Coefficient: 0.9995
4	5.0	1.3663	44	
5	5.6	1.4493	48	



Calibrated By: *Wayan B*  
Approved By: *Mark Chandra*  
(Mr. Wayan Chandra)  
Field Scientist (1)  
Manager

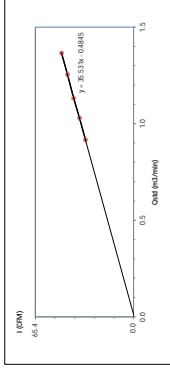
FORM NO. F 56-09, REVISION NO. 1, ISSUE DATE 14/03/16



High Volume Air Sampler Calibration Worksheet

Project Site :	Magnesium Co. Ltd.	Barometric Pressure (mm Hg) :	759
Calibrate Location :	Spenthu (A3)	Temperature (°C) :	33
Calibrate Date :	14-Jun-22	High Volume ID :	BK6-F50374
Calibration Sheet No. :	C-140122-BK6-F50374	High Volume Model :	TE-5009X
Calibrator ID :	BK6-F50524	High Volume S/N :	5195
Calibrator Model :	TE-5020A	Calibrator Slope :	1.6462
Calibrator S/N :	2584	Calibrator Intercept :	-0.02902

Test No.	Delta (C) (ppm)	Q <sub>std</sub> (ppm)	1 Chart (ppm)	Linear Regression
1	2.2	0.9168	32	Slope: 33.5206
2	2.8	1.0296	36	Intercept: -0.1645
3	3.4	1.1315	40	Correlation Coefficient: 0.9997
4	4.2	1.2543	44	
5	5.0	1.3560	48	



Calibrated By: *Wayan B*  
Approved By: *Mark Chandra*  
(Mr. Wayan Chandra)  
Field Scientist (1)  
Manager

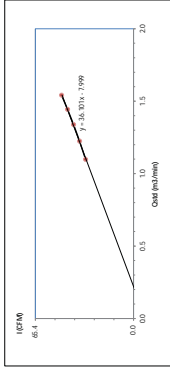
FORM NO. F 56-09, REVISION NO. 1, ISSUE DATE 14/03/16



High Volume Air Sampler Calibration Worksheet

Project Site :	Magnesium Co. Ltd.	Barometric Pressure (mm Hg) :	759
Calibrate Location :	Spenthu (A3)	Temperature (°C) :	33
Calibrate Date :	14-Jun-22	High Volume ID :	BK6-F51060
Calibration Sheet No. :	C-140122-BK6-F51060	High Volume Model :	TE-5009X
Calibrator ID :	BK6-F50524	High Volume S/N :	5503
Calibrator Model :	TE-5020A	Calibrator Slope :	1.6462
Calibrator S/N :	2584	Calibrator Intercept :	-0.02902

Test No.	Delta (C) (ppm)	Q <sub>std</sub> (ppm)	1 Chart (ppm)	Linear Regression
1	3.2	1.0986	32	Slope: 36.1072
2	4.0	1.2248	36	Intercept: -2.7990
3	4.8	1.3389	40	Correlation Coefficient: 0.9997
4	5.6	1.4439	44	
5	6.4	1.5416	48	



Calibrated By: *Wayan B*  
Approved By: *Mark Chandra*  
(Mr. Wayan Chandra)  
Field Scientist (1)  
Manager

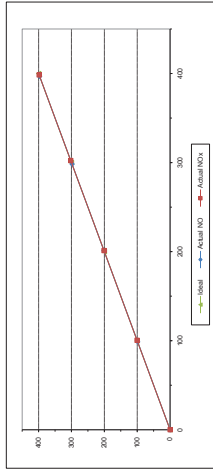
FORM NO. F 56-09, REVISION NO. 1, ISSUE DATE 14/03/16



MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jun-22	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-37D
Serial No.	2000	Equipment ID	BK6-F50379
Calibrator Manufacturer	TECHSYNE API	Model	710
Serial No.	947		
Std. Gas Concentration (PPM)	61.35	Cylinder No.	LL36853
Cylinder Pressure (psi)	1200	Certified By	Algas Inc.
Certified Date	15-Mar-14	Expired Date	15-Mar-22

Point	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10
1	100.00	99.80	-1.20	-1.20	100.50	0.50
2	200.00	201.50	1.50	0.75	201.20	0.60
3	300.00	298.40	-1.60	-0.53	302.30	0.77
4	400.00	398.90	-1.10	-0.28	398.30	-0.38
AVERAGE (%)			-0.38			0.32



Calibrated By: *Wayan B*  
Approved By: *Mark Chandra*  
(Mr. Wayan Chandra)  
Field Environmental Scientist (3)  
Assistant General Manager

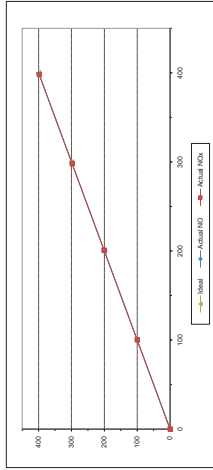
FORM NO. F 56-09, REVISION NO. 1, ISSUE DATE 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jun-22	Equipment Name	NOx Analyzer
Manufacturer	TECHSYNE API	Model	200E
Serial No.	5775	Equipment ID	BK6-F50378
Calibrator Manufacturer	TECHSYNE API	Model	710
Serial No.	947		
Std. Gas Concentration (PPM)	61.35	Cylinder No.	LL36853
Cylinder Pressure (psi)	1200	Certified By	Algas Inc.
Certified Date	15-Mar-14	Expired Date	15-Mar-22

Point	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10
1	100.00	99.20	-0.80	-0.80	100.30	0.30
2	200.00	199.30	-0.70	-0.35	201.00	0.50
3	300.00	298.50	-1.50	-0.50	298.00	-0.67
4	400.00	398.50	-1.50	-0.38	398.10	-0.47
AVERAGE (%)			-0.38			-0.05



Calibrated By: *Wayan B*  
Approved By: *Mark Chandra*  
(Mr. Wayan Chandra)  
Field Environmental Scientist (3)  
Assistant General Manager

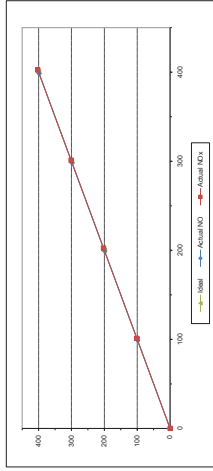
FORM NO. F 56-09, REVISION NO. 1, ISSUE DATE 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jun-22	Equipment Name	NOx Analyzer
Manufacturer	TECHSYNE API	Model	200E
Serial No.	4575	Equipment ID	BK6-F50379
Calibrator Manufacturer	TECHSYNE API	Model	710
Serial No.	947		
Std. Gas Concentration (PPM)	61.35	Cylinder No.	LL36853
Cylinder Pressure (psi)	1200	Certified By	Algas Inc.
Certified Date	15-Mar-14	Expired Date	15-Mar-22

Point	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10
1	100.00	99.10	-0.90	-0.90	101.20	1.20
2	200.00	199.50	-0.50	-0.25	202.60	2.60
3	300.00	298.20	-1.80	-0.60	301.30	0.43
4	400.00	398.70	-1.30	-0.33	402.60	2.60
AVERAGE (%)			-0.40			0.74



Calibrated By: *Wayan B*  
Approved By: *Mark Chandra*  
(Mr. Wayan Chandra)  
Field Environmental Scientist (3)  
Assistant General Manager

FORM NO. F 56-09, REVISION NO. 1, ISSUE DATE 02/04/12








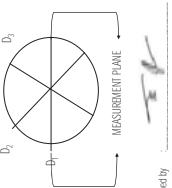








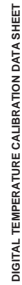
Where: $D_1, D_2, D_3$	= Three different inside diameters of allologies to each other, each measured to the nearest 0.025 mm.		Approved by 
AD	= Maximum distance between any two diameters, must be $\geq 0.10$ mm.		
$D_{avg}$	$= (D_1 + D_2 + D_3) / 3$		
Calculated by			



Mr Oswald Wongchan  
Field Scientist (2)

Mr Samat Boonjan  
Specialist (1)

FORMS 1 (Rev. 10/2004) - (02/01/2005)



Calibration Date	6 Jan 22	As-built Temperature (°C)	32	
Calibration Model No.	C-000162-88C-350449	Relative Humidity (RH)	68	
Digital Temperature ID	BK-F-350449	Reference Temperature (°C)	BK-F-251144	
Serial No.:	1901883	Model:	20100000013	
Model:	XC-572-V	Next Calibrate	Digicon CVC-V148 31 Jan 22	
Location	Reference Temperature (°C)	Digital Temperature (°C)	Error (°C)	Remark
Stack	25	26	1	
	25	26	1	
	40	41	1	
	100	101	1	
	200	201	1	
	250	251	1	
	250	252	2	
	500	502	2	
	600	602	2	
Potato	1000	1002	2	
	1250	1252	2	
	150	151	1	
	125	126	1	
Oxam	150	151	1	
	100	101	1	
	150	151	1	
Fiber	150	151	1	
	100	101	1	
	150	151	1	
Est	1	1	1	
	10	11	1	
	20	21	1	
Meter	25	26	1	
	1	1	1	
	50	51	1	
AUX	0	0	0	
	0	0	0	
	50	51	1	

Calibrated by: Nelcom S (W/Nelcom Sukjorn) Field Scientist (3)

Approved by: [Signature] (W/Samet Roongn) Field Specialist (1)

PCAM NO: F06-027 REVISED NO: - ISSUE DATE: 2/5/02



Run No.	Time Actual (masses)	Time Reading (press)	Diff. (ms)	Diff. (m/s)
1	5:00:11	5:00	11	0.0018
2	5:00:11	5:00	11	0.0018
3	5:00:12	5:00	12	0.0020
4	5:00:10	5:00	10	0.0017
5	5:00:10	5:00	10	0.0017
6	5:00:11	5:00	11	0.0018
7	5:00:10	5:00	10	0.0017
8	5:00:12	5:00	12	0.0020
9	5:00:12	5:00	12	0.0020
10	5:00:11	5:00	11	0.0018
			Average	0.0018
			SD	0.0001

Calibrate by:	Mr. Wrawich Tonggorn	Approved by:	Mr. Sanart Ro-ngan
	Field Scientist (2)		Specialist (1)



Pilot Tube Identification Number:	BKK_FS0453	Calibration Date:	6 Jan 22
Lab test duct Number:	258-1-13-01	Standard Pilot ID:	BKK_FS0454
Calibration Sheet No.:	C-060112-BKK_FS0453	Co Standard:	0.99

Types 5 Print Tube Coefficient Data					
	Type 5 spot tube Leg A/B	Standard point tube (AP, mmH <sub>2</sub> O)	Type 5 spot tube (AP, mmH <sub>2</sub> O)	Cp (s) Leg A	Cp (s) Leg B
Test 1	A	12.00	16.60	0.842	-
	B	12.00	16.60	-	0.842
Test 2	A	12.00	16.60	0.842	-
	B	12.00	16.60	-	0.842
Test 3	A	12.00	16.60	0.842	-
	B	12.00	16.60	-	0.842
			$\tau_{CP}$	0.842	0.842


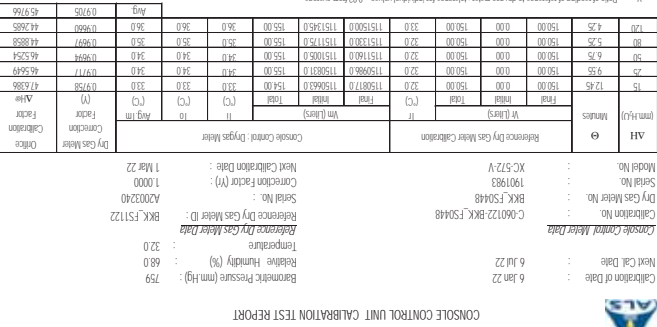
$$Cp(S) = Cp_{(st)} \sqrt{\frac{\Delta P(stf)}{\Delta P(S)}}$$

$$(\bar{C}_{0(A)} - \bar{C}_{0(P)}) \text{ must BE } < 0.01$$

$$\frac{\sum_i [Cp(s) - Cp(A \text{ or } B)]}{\text{Average deviation}(A \text{ or } B)} = \frac{\text{must BE} \leq 0.01}{3}$$

Calibrated by	Approved by
 (Mr. Mubom Sijakson) Elder S. C. 20	 (Mr. Samrat Rongnan) Elder S. C. 11

FORM NO. F 06-005 REVISED NO. - ISSUE DATE 9/9/02



Calibration of Date :  
Next Cal. Date :



Pipet Tube Identification Number : BKK_FS0452 Lab test duct Number : 258-1-13-01 Calibration Sheet No. : C060122-BKK_FS0452	Calibration Date : 6 Jan 22 Standard Pipet ID : BKK_FS0441 Co Standard : 0.99
---	---

		Types 3 and 4: Coefficient Data			
	Type 3 plot type Log(A/B)	Standard plot type $\log(H/Q)$	Type 3 plot type $\log(H/Q)$	Types 3 and 4 Log B	Types 3 and 4 Log B
Test 1	A	12.00	16.60	0.942	-
	B	12.00	16.60	-	0.942
Test 2	A	12.00	16.60	0.942	-
	B	12.00	16.60	-	0.942
Test 3	A	12.00	16.60	0.942	-
	B	12.00	16.60	-	0.942
			$\overline{QD}$	0.942	0.942

$$C_p(s) = C_p(\omega) \sqrt{\frac{\Delta P(\text{std})}{\Delta P(s)}}$$

$$[\bar{C}_{D/A} - \bar{C}_{D/PA}] \text{ must BE } < 0.01$$

$$\text{Average deviation(A or B)} = \frac{\sum [Cp(s) - Cp(A \text{ or } B)]}{3} \quad \text{must BE} < 0.01$$

Calibrated by	Approved by
 (M. Nakom Sukpradon) Ekalak Sarnakul (20)	 (M. Samat Boonpan) Ekalak Sarnakul (20)

FORM NO: F 04-005 REVISED: 9/10.02



PROBE NOZZLE DIAMETER  
CALIBRATION DATA SHEET

Calibration Date	6 Jan 22	North-Sat ID	BKK-ES0454
Calibration Sheet No.	C-060122-BKK-ES0454	Vendor Catalog ID	BKK-ES0626
Nozzle Diameter (cm)			
Nozzle ID #	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>
1	0.315	0.315	0.315
2	0.475	0.475	0.475
3	0.635	0.635	0.635
4	0.790	0.790	0.790
5	0.950	0.950	0.950
6	1.110	1.110	1.110
7	1.270	1.270	1.270
8	1.600	1.600	1.600



Calibrated by: Nelson S (M-Nelson Sajjanon) Field Specialist (I)

FORM 19-01, REVISED 06-05-2010

BKK-EL-0037

Agent Certified Compliance Services

### Certificate of System Qualification

65-002

System ID	MP1000000
Organization Name	ALS Laboratory Group (Thailand) Co., Ltd.
Organization Location	101 Prachinburi Road, Prachinburi, Bangkok 10000
Date	September 13, 2021 10:11 PM
MP Name	Agent Certified Compliance
MP Number	65-002-001
Overall Calibration Status	Pass
Preparation	
Parts	
Instrument Type	
Part	
Accessories/Signature	

APPROVED BY: Nelson S  
MKT CAL. IMAGE 25 Feb 20

Date: September 13, 2021 10:11 PM  
System ID: MP1000000

Page 1 of 8



Pilot Tube Calibration Data

Pilot Tube Identification Number: BKK-ES0453  
Lab/duct Number: 258-113-01  
Calibration Sheet No.: C-060122-BKK-ES0453

Type-S Pilot Tube Coefficient Data				
Test 1	Type-S Pilot Tube Log A/B (ΔP mm H <sub>2</sub> O)	Type-S Pilot Tube Log A (ΔP mm H <sub>2</sub> O)	Qp (s)	Qp (s) Log B
1	A	12.00	16.60	0.842
2	B	12.00	16.60	0.842
3	A	12.00	16.60	0.842
4	B	12.00	16.60	0.842

$$Qp(S) = Qp_{avg} \sqrt{\frac{\Delta P_{std}}{\Delta P}} \quad \text{must BE } \leq 0.01$$
$$Qp(S) = Qp(A) - Qp(B) \quad \text{must BE } \leq 0.01$$
$$\text{Average deviation (A or B)} = \frac{\sum (Qp(A) - Qp(B) \text{ or } B)}{3} \quad \text{must BE } \leq 0.01$$

Calibrated by: Nelson S (M-Nelson Sajjanon) Field Specialist (I)

FORM 19-01, REVISED 06-05-2010

Agent Certified Compliance Services

### Instrument Details

This section describes the as found system configurations.

Specifications 1	Agent Technologies
Manufacturer	5100 BVDV
Name	Q510A
Model Number	Double pass glass optical nephelometer and neapray analyzer
Serial Number	MP10010002
Field Number	5100
Caliber 1	Agent Technologies
Manufacturer	Other Unspecified
Name	Other Unspecified
Model Number	Other Unspecified
Serial Number	Other Unspecified
Field Number	Other Unspecified
Accessories 1	Agent Technologies
Manufacturer	BP34
Name	Q4410A
Model Number	AU15442754
Serial Number	SVS 2+
Field Number	Q4410A
Accessories/Signature	AU10000115

APPROVED BY: Nelson S  
MKT CAL. IMAGE 25 Feb 20

Date: September 13, 2021 10:11 PM  
System ID: MP1000000

Page 2 of 8

Agent Certified Compliance Services

### MULTIPOINT CALIBRATION REPORT

APPROVED BY: Nelson S  
MKT CAL. IMAGE 25 Feb 20

CUSTOMER NAME	ALS Laboratory Group (Thailand) Co., Ltd.
EQUIPMENT NAME	CO Analyzer
MANUFACTURER	TECHNICAL
MODEL	MODEL 1200
SERIAL NUMBER	1706
CYLINDER NO.	CC20002
CERTIFIED DATE	Nov 05, 2020
EXPIRED DATE	Nov 05, 2028

CERTIFIED BY: ANGAS SPECIALTY GASES

### CALIBRATION RESULTS

POINT NO	ACTUAL CO (PPM)	SENDER CO (PPM)	% ERROR CO
ZERO	0.00	0.00	-
1	50.00	50.20	0.20
2	90.00	90.10	0.11
3	400.00	399.50	-0.10
4	800.00	800.70	0.10
AVERAGE (%)			0.20

Calibrated by: Nelson S (M-Nelson Sajjanon) Field Specialist (I)

APPROVED BY: Nelson S  
MKT CAL. IMAGE 25 Feb 20

Date: September 13, 2021 10:11 PM  
System ID: MP1000000

Page 3 of 8

Agent Certified Compliance Services

### Electronic Signature

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Details:

Full Name of Signer: Kanyakorn Subparitakorn  
Logged On User Name: kanyakorn.subparitakorn@agent.com  
Signature Creation Date: September 13, 2021  
Reason for Signature: Enclosed protocol and published this original version of document

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Date: September 13, 2021 10:11 PM  
System ID: MP1000000

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**BRS**  
Bioscience Resource  
Project



**BRS**  
Bioscience Resource  
Project



**BRS**  
Bioscience Resource  
Project

**BRS Bioscience, Inc., Ltd.**  
1800 E. Chippewa Avenue, Suite 1000  
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Phone: 608/263-8200  
Fax: 608/263-8201  
Internet: [www.brs-science.org](http://www.brs-science.org)

 **Brylcrelle**  
 New Brunswick Co., Ltd.  
 1000 Highway 100, Suite 100  
 St. John's, NL A1A 1A1  
 Tel: (709) 576-1111  
 Fax: (709) 576-1112

 **Brylcrelle**  
 New Brunswick Co., Ltd.

 **Brylcrelle**  
 New Brunswick Co., Ltd.

# Certificate of Calibration

Certificate No.

BMCC-001-0001

Number of Pages

1 of 1

Calibration Results:

[Measurement Accuracy] (µm/s)

Measurement Range (mm)	Calibration Uncertainty (µm)	UMC (µm)	Error (µm)	Interpolating (µm)
0.000	0.000	0.000	0.000	0.000
0.001	0.001	0.001	0.001	0.001
0.002	0.002	0.002	0.002	0.002
0.003	0.003	0.003	0.003	0.003
0.004	0.004	0.004	0.004	0.004
0.005	0.005	0.005	0.005	0.005
0.006	0.006	0.006	0.006	0.006
0.007	0.007	0.007	0.007	0.007
0.008	0.008	0.008	0.008	0.008
0.009	0.009	0.009	0.009	0.009
0.010	0.010	0.010	0.010	0.010
0.011	0.011	0.011	0.011	0.011
0.012	0.012	0.012	0.012	0.012
0.013	0.013	0.013	0.013	0.013
0.014	0.014	0.014	0.014	0.014
0.015	0.015	0.015	0.015	0.015
0.016	0.016	0.016	0.016	0.016
0.017	0.017	0.017	0.017	0.017
0.018	0.018	0.018	0.018	0.018
0.019	0.019	0.019	0.019	0.019
0.020	0.020	0.020	0.020	0.020
0.021	0.021	0.021	0.021	0.021
0.022	0.022	0.022	0.022	0.022
0.023	0.023	0.023	0.023	0.023
0.024	0.024	0.024	0.024	0.024
0.025	0.025	0.025	0.025	0.025
0.026	0.026	0.026	0.026	0.026
0.027	0.027	0.027	0.027	0.027
0.028	0.028	0.028	0.028	0.028
0.029	0.029	0.029	0.029	0.029
0.030	0.030	0.030	0.030	0.030
0.031	0.031	0.031	0.031	0.031
0.032	0.032	0.032	0.032	0.032
0.033	0.033	0.033	0.033	0.033
0.034	0.034	0.034	0.034	0.034
0.035	0.035	0.035	0.035	0.035
0.036	0.036	0.036	0.036	0.036
0.037	0.037	0.037	0.037	0.037
0.038	0.038	0.038	0.038	0.038
0.039	0.039	0.039	0.039	0.039
0.040	0.040	0.040	0.040	0.040
0.041	0.041	0.041	0.041	0.041
0.042	0.042	0.042	0.042	0.042
0.043	0.043	0.043	0.043	0.043
0.044	0.044	0.044	0.044	0.044
0.045	0.045	0.045	0.045	0.045
0.046	0.046	0.046	0.046	0.046
0.047	0.047	0.047	0.047	0.047
0.048	0.048	0.048	0.048	0.048
0.049	0.049	0.049	0.049	0.049
0.050	0.050	0.050	0.050	0.050
0.051	0.051	0.051	0.051	0.051
0.052	0.052	0.052	0.052	0.052
0.053	0.053	0.053	0.053	0.053
0.054	0.054	0.054	0.054	0.054
0.055	0.055	0.055	0.055	0.055
0.056	0.056	0.056	0.056	0.056
0.057	0.057	0.057	0.057	0.057
0.058	0.058	0.058	0.058	0.058
0.059	0.059	0.059	0.059	0.059
0.060	0.060			

[illegible]

 **Brylcrelle**  
 New Brunswick Co., Ltd.  
 1000 Highway 100, Suite 100  
 St. John's, NL A1A 1A1  
 Tel: (709) 576-1111  
 Fax: (709) 576-1112

 **Brylcrelle**  
 New Brunswick Co., Ltd.

 **Brylcrelle**  
 New Brunswick Co., Ltd.

# Certificate of Calibration

Certificate No.

BMCC-001-0001

Number of Pages

1 of 1

Calibration Results:

[Measurement Accuracy] (µm/s)

Measurement Range (mm)	Calibration Uncertainty (µm)	UMC (µm)	Error (µm)	Interpolating (µm)
0.000	0.000	0.000	0.000	0.000
0.001	0.001	0.001	0.001	0.001
0.002	0.002	0.002	0.002	0.002
0.003	0.003	0.003	0.003	0.003
0.004	0.004	0.004	0.004	0.004
0.005	0.005	0.005	0.005	0.005
0.006	0.006	0.006	0.006	0.006
0.007	0.007	0.007	0.007	0.007
0.008	0.008	0.008	0.008	0.008
0.009	0.009	0.009	0.009	0.009
0.010	0.010	0.010	0.010	0.010
0.011	0.011	0.011	0.011	0.011
0.012	0.012	0.012	0.012	0.012
0.013	0.013	0.013	0.013	0.013
0.014	0.014	0.014	0.014	0.014
0.015	0.015	0.015	0.015	0.015
0.016	0.016	0.016	0.016	0.016
0.017	0.017	0.017	0.017	0.017
0.018	0.018	0.018	0.018	0.018
0.019	0.019	0.019	0.019	0.019
0.020	0.020	0.020	0.020	0.020
0.021	0.021	0.021	0.021	0.021
0.022	0.022	0.022	0.022	0.022
0.023	0.023	0.023	0.023	0.023
0.024	0.024	0.024	0.024	0.024
0.025	0.025	0.025	0.025	0.025
0.026	0.026	0.026	0.026	0.026
0.027	0.027	0.027	0.027	0.027
0.028	0.028	0.028	0.028	0.028
0.029	0.029	0.029	0.029	0.029
0.030	0.030	0.030	0.030	0.030
0.031	0.031	0.031	0.031	0.031
0.032	0.032	0.032	0.032	0.032
0.033	0.033	0.033	0.033	0.033
0.034	0.034	0.034	0.034	0.034
0.035	0.035	0.035	0.035	0.035
0.036	0.036	0.036	0.036	0.036
0.037	0.037	0.037	0.037	0.037
0.038	0.038	0.038	0.038	0.038
0.039	0.039	0.039	0.039	0.039
0.040	0.040	0.040	0.040	0.040
0.041	0.041	0.041	0.041	0.041
0.042	0.042	0.042	0.042	0.042
0.043	0.043	0.043	0.043	0.043
0.044	0.044	0.044	0.044	0.044
0.045	0.045	0.045	0.045	0.045
0.046	0.046	0.046	0.046	0.046
0.047	0.047	0.047	0.047	0.047
0.048	0.048	0.048	0.048	0.048
0.049	0.049	0.049	0.049	0.049
0.050	0.050	0.050	0.050	0.050
0.051	0.051	0.051	0.051	0.051
0.052	0.052	0.052	0.052	0.052
0.053	0.053	0.053	0.053	0.053
0.054	0.054	0.054	0.054	0.054
0.055	0.055	0.055	0.055	0.055
0.056	0.056	0.056	0.056	0.056
0.057	0.057	0.057	0.057	0.057
0.058	0.058	0.058	0.058	0.058
0.059	0.059	0.059	0.059	0.059
0.060	0.060			

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## CALIBRATION REPORT

Calibration Date	4-Jun-22	Equipment ID	BNC F30708
Equipment Name	FID Analyzer	Manufacturer	Baseline Moon
Model	900PH	Serial No.	0318E70047
Std Gas Conc. (ppm)	193	Cylinder No.	D916022
Certified Date	17-Sep-14	Expiry Date	17-Sep-22

### CALIBRATION RESULTS

Point	CALIBRATION RESULTS			%Error
	Ideal	Actual	Error	
ZERO	0.00	0.04	0.04	0.04
SPAN	193.00	192.50	-0.20	-0.10
AVERAGE (%)				-0.08

Point	Ideal	Actual
ZERO	0.00	0.04
SPAN	193.00	192.50

Calibrated By

*[Signature]*

(Mr. Ajit Shinde)  
Field Environmental Scientist (4)

Approved By

*[Signature]*

(Mr. Samarth Illangudi)  
Assistant General Manager

ALS Laboratory Group

[illegible]





## Summary of Measurement Results:

Parameter	Pass	Fail	Conformance	Maximum permitted uncertainty of measurement (MPE)
1. Absolute uncertainty	✓	✓	✓	N/A
2. Self-generated noise	✓	✓	✓	N/A
3. Acoustic signal tone of frequency weighting	✓	✓	✓	N/A
4. Electrical signal tone of frequency weighting	✓	✓	✓	N/A
5. Frequency and time weighting	✓	✓	✓	N/A
6. Long-term stability	✓	✓	✓	N/A
7. Level stability on the reference level range	✓	✓	✓	N/A
8. Level stability including the level range control	✓	✓	✓	N/A
9. Time burst response	✓	✓	✓	N/A
10. Peak C-weight level	✓	✓	✓	N/A
11. Overload indication	✓	✓	✓	N/A
12. High level stability	✓	✓	✓	N/A

QP-0012-04-04-00000

7. Rb...

## 5. Level stability on the reference level range

Accepted Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
117.0	117.1	0.1	±0.2
118.0	118.1	0.1	±0.2
119.0	119.1	0.1	±0.2
120.0	120.1	0.1	±0.2
121.0	121.1	0.1	±0.2
122.0	122.1	0.1	±0.2
123.0	123.1	0.1	±0.2
124.0	124.1	0.1	±0.2
125.0	125.1	0.1	±0.2
126.0	126.1	0.1	±0.2
127.0	127.1	0.1	±0.2
128.0	128.1	0.1	±0.2
129.0	129.1	0.1	±0.2
130.0	130.1	0.1	±0.2
131.0	131.1	0.1	±0.2
132.0	132.1	0.1	±0.2
133.0	133.1	0.1	±0.2
134.0	134.1	0.1	±0.2
135.0	135.1	0.1	±0.2
136.0	136.1	0.1	±0.2
137.0	137.1	0.1	±0.2
138.0	138.1	0.1	±0.2
139.0	139.1	0.1	±0.2
140.0	140.1	0.1	±0.2
141.0	141.1	0.1	±0.2
142.0	142.1	0.1	±0.2
143.0	143.1	0.1	±0.2
144.0	144.1	0.1	±0.2
145.0	145.1	0.1	±0.2
146.0	146.1	0.1	±0.2
147.0	147.1	0.1	±0.2
148.0	148.1	0.1	±0.2
149.0	149.1	0.1	±0.2
150.0	150.1	0.1	±0.2
151.0	151.1	0.1	±0.2
152.0	152.1	0.1	±0.2
153.0	153.1	0.1	±0.2
154.0	154.1	0.1	±0.2
155.0	155.1	0.1	±0.2
156.0	156.1	0.1	±0.2
157.0	157.1	0.1	±0.2
158.0	158.1	0.1	±0.2
159.0	159.1	0.1	±0.2
160.0	160.1	0.1	±0.2
161.0	161.1	0.1	±0.2
162.0	162.1	0.1	±0.2
163.0	163.1	0.1	±0.2
164.0	164.1	0.1	±0.2
165.0	165.1	0.1	±0.2
166.0	166.1	0.1	±0.2
167.0	167.1	0.1	±0.2
168.0	168.1	0.1	±0.2
169.0	169.1	0.1	±0.2
170.0	170.1	0.1	±0.2
171.0	171.1	0.1	±0.2
172.0	172.1	0.1	±0.2
173.0	173.1	0.1	±0.2
174.0	174.1	0.1	±0.2
175.0	175.1	0.1	±0.2
176.0	176.1	0.1	±0.2
177.0	177.1	0.1	±0.2
178.0	178.1	0.1	±0.2
179.0	179.1	0.1	±0.2
180.0	180.1	0.1	±0.2
181.0	181.1	0.1	±0.2
182.0	182.1	0.1	±0.2
183.0	183.1	0.1	±0.2
184.0	184.1	0.1	±0.2
185.0	185.1	0.1	±0.2
186.0	186.1	0.1	±0.2
187.0	187.1	0.1	±0.2
188.0	188.1	0.1	±0.2
189.0	189.1	0.1	±0.2
190.0	190.1	0.1	±0.2
191.0	191.1	0.1	±0.2
192.0	192.1	0.1	±0.2
193.0	193.1	0.1	±0.2
194.0	194.1	0.1	±0.2
195.0	195.1	0.1	±0.2
196.0	196.1	0.1	±0.2
197.0	197.1	0.1	±0.2
198.0	198.1	0.1	±0.2
199.0	199.1	0.1	±0.2
200.0	200.1	0.1	±0.2
201.0	201.1	0.1	±0.2
202.0	202.1	0.1	±0.2
203.0	203.1	0.1	±0.2
204.0	204.1	0.1	±0.2
205.0	205.1	0.1	±0.2
206.0	206.1	0.1	±0.2
207.0	207.1	0.1	±0.2
208.0	208.1	0.1	±0.2
209.0	209.1	0.1	±0.2
210.0	210.1	0.1	±0.2
211.0	211.1	0.1	±0.2
212.0	212.1	0.1	±0.2
213.0	213.1	0.1	±0.2
214.0	214.1	0.1	±0.2
215.0	215.1	0.1	±0.2
216.0	216.1	0.1	±0.2
217.0	217.1	0.1	±0.2
218.0	218.1	0.1	±0.2
219.0	219.1	0.1	±0.2
220.0	220.1	0.1	±0.2
221.0	221.1	0.1	±0.2
222.0	222.1	0.1	±0.2
223.0	223.1	0.1	±0.2
224.0	224.1	0.1	±0.2
225.0	225.1	0.1	±0.2
226.0	226.1	0.1	±0.2
227.0	227.1	0.1	±0.2
228.0	228.1	0.1	±0.2
229.0	229.1	0.1	±0.2
230.0	230.1	0.1	±0.2
231.0	231.1	0.1	±0.2
232.0	232.1	0.1	±0.2
233.0	233.1	0.1	±0.2
234.0	234.1	0.1	±0.2
235.0	235.1	0.1	±0.2
236.0	236.1	0.1	±0.2
237.0	237.1	0.1	±0.2
238.0	238.1	0.1	±0.2
239.0	239.1	0.1	±0.2
240.0	240.1	0.1	±0.2
241.0	241.1	0.1	±0.2
242.0	242.1	0.1	±0.2
243.0	243.1	0.1	±0.2
244.0	244.1	0.1	±0.2
245.0	245.1	0.1	±0.2
246.0	246.1	0.1	±0.2
247.0	247.1	0.1	±0.2
248.0	248.1	0.1	±0.2
249.0	249.1	0.1	±0.2
250.0	250.1	0.1	±0.2
251.0	251.1	0.1	±0.2
252.0	252.1	0.1	±0.2
253.0	253.1	0.1	±0.2
254.0	254.1	0.1	±0.2
255.0	255.1	0.1	±0.2
256.0	256.1	0.1	±0.2
257.0	257.1	0.1	±0.2
258.0	258.1	0.1	±0.2
259.0	259.1	0.1	±0.2
260.0	260.1	0.1	±0.2
261.0	261.1	0.1	±0.2
262.0	262.1	0.1	±0.2
263.0	263.1	0.1	±0.2
264.0	264.1	0.1	±0.2
265.0	265.1	0.1	±0.2
266.0	266.1	0.1	±0.2
267.0	267.1	0.1	±0.2
268.0	268.1	0.1	±0.2
269.0	269.1	0.1	±0.2
270.0	270.1	0.1	±0.2
271.0	271.1	0.1	±0.2
272.0	272.1	0.1	±0.2
273.0	273.1	0.1	±0.2
274.0	274.1	0.1	±0.2
275.0	275.1	0.1	±0.2
276.0	276.1	0.1	±0.2
277.0	277.1	0.1	±0.2
278.0	278.1	0.1	±0.2
279.0	279.1	0.1	±0.2
280.0	280.1	0.1	±0.2
281.0	281.1	0.1	±0.2
282.0	282.1	0.1	±0.2
283.0	283.1	0.1	±0.2
284.0	284.1	0.1	±0.2
285.0	285.1	0.1	±0.2
286.0	286.1	0.1	±0.2
287.0	287.1	0.1	±0.2
288.0	288.1	0.1	±0.2
289.0	289.1	0.1	±0.2
290.0	290.1	0.1	±0.2
291.0	291.1	0.1	±0.2
292.0	292.1	0.1	±0.2
293.0	293.1	0.1	±0.2
294.0	294.1	0.1	±0.2
295.0	295.1	0.1	±0.2
296.0	296.1	0.1	±0.2
297.0	297.1	0.1	±0.2
298.0	298.1	0.1	±0.2
299.0	299.1	0.1	±0.2
300.0	300.1	0.1	±0.2
301.0	301.1	0.1	±0.2
302.0	302.1	0.1	±0.2
303.0	303.1	0.1	±0.2
304.0	304.1	0.1	±0.2
305.0	305.1	0.1	±0.2
306.0	306.1	0.1	±0.2
307.0	307.1	0.1	±0.2
308.0	308.1	0.1	±0.2
309.0	309.1	0.1	±0.2
310.0	310.1	0.1	±0.2
311.0	311.1	0.1	±0.2
312.0	312.1	0.1	±0.2
313.0	313.1	0.1	±0.2
314.0	314.1	0.1	±0.2
315.0	315.1	0.1	±0.2
316.0	316.1	0.1	±0.2
317.0	317.1	0.1	±0.2
318.0	318.1	0.1	±0.2
319.0	319.1	0.1	±0.2
320.0	320.1	0.1	±0.2
321.0	321.1	0.1	±0.2
322.0	322.1	0.1	±0.2
323.0	323.1	0.1	±0.2
324.0	324.1	0.1	±0.2
325.0	325.1	0.1	±0.2
326.0	326.1	0.1	±0.2
327.0	327.1	0.1	±0.2
328.0	328.1	0.1	±0.2
329.0	329.1	0.1	±0.2
330.0	330.1	0.1	±0.2
331.0	331.1	0.1	±0.2
332.0	332.1	0.1	±0.2
333.0	333.1	0.1	±0.2
334.0	334.1	0.1	±0.2
335.0	335.1	0.1	±0.2
336.0	336.1	0.1	±0.2
337.0	337.1	0.1	±0.2
338.0	338.1	0.1	±0.2
339.0	339.1	0.1	±0.2
340.0	340.1	0.1	±0.2
341.0	341.1	0.1	±0.2
342.0	342.1	0.1	±0.2
343.0	343.1	0.1	±0.2
344.0	344.1	0.1	±0.2
345.0	345.1	0.1	±0.2
346.0	346.1	0.1	±0.2
347.0	347.1	0.1	±0.2
348.0	348.1	0.1	±0.2
349.0	349.1	0.1	±0.2
350.0	350.1	0.1	±0.2
351.0	351.1	0.1	±0.2
352.0	352.1	0.1	±0.2
353.0	353.1	0.1	±0.2
354.0	354.1	0.1	±0.2
355.0	355.1	0.1	±0.2
356.0	356.1	0.1	±0.2
357.0	357.1	0.1	±0.2
358.0	358.1	0.1	±0.2
359.0	359.1	0.1	±0.2
360.0	360.1	0.1	±0.2
361.0	361.1	0.1	±0.2
362.0	362.1	0.1	±0.2
363.0	363.1	0.1	±0.2
364.0	364.1	0.1	±0.2
365.0	365.1	0.1	±0.2
366.0	366.1	0.1	±0.2
367.0	367.1	0.1	±0.2
368.0	368.1	0.1	±0.2
369.0	369.1	0.1	±0.2
370.0	370.1	0.1	±0.2
371.0	371.1	0.1	±0.2
372.0	372.1	0.1	±0.2
373.0	373.1	0.1	±0.2
374.0	374.1	0.1	±0.2
375.0	375.1	0.1	±0.2
376.0	376.1	0.1	±0.2
377.0	377.1	0.1	±0.2
378.0	378.1	0.1	±0.2
379.0	379.1	0.1	±0.2
380.0	380.1	0.1	±0.2
381.0	381.1	0.1	±0.2
382.0	382.1	0.1	±0.2
383.0	383.1	0.1	±0.2
384.0	384.1	0.1	±0.2
385.0	385.1	0.1	±0.2
386.0	386.1	0.1	±0.2
387.0	387.1	0.1	±0.2
388.0	388.1	0.1	±0.2
389.0	389.1	0.1	±0.2
390.0	390.1	0.1	±0.2
391.0	391.1	0.1	±0.2
392.0	392.1	0.1	±0





8. Load capacity including the load range control

Range	Assigned Value (g)	Measured Value (g)	Deviation Value (g)	Acceptance Limit (g)
Sum	94.3	94.3	0.0	±1.3

9. Force limit response

Time	Time Span	Cycle	Assigned Value (g)	Measured Value (g)	Deviation Value (g)	Acceptance Limit (g)
Weighting	0.25	1	100.0	107.9	-7.9	±1.3 (0.1)
Force	2	8	117.8	117.8	0.0	±0.5 (0.1)
Flow	200	1000	134.8	134.8	0.0	±0.5 (0.1)
Flow	200	1000	150.8	150.8	0.0	±0.5 (0.1)
Flow	200	1000	177.8	177.8	0.0	±0.5 (0.1)
Flow	200	1000	204.8	204.8	0.0	±0.5 (0.1)
Flow	200	1000	231.8	231.8	0.0	±0.5 (0.1)

10. Peak Control level

Number of cycle in assigned	Assigned Value (g)	Measured Value (g)	Deviation Value (g)	Acceptance Limit (g)
1	100.0	107.9	-7.9	±1.3

Number of cycle in assigned	Assigned Value (g)	Measured Value (g)	Deviation Value (g)	Acceptance Limit (g)
1	100.0	107.9	-7.9	±1.3

QP-1012-04-04-00004

T. Ratan

Calibration Procedures : CP-A-01

Calibration Method 1

This equipment was calibrated by based on ISO 9001:2015 Standard for quality management system (QMS).  
The 0.1 Hz test was in accordance and followed signal range of frequency weighting with acceleration and tolerance Standard.

For each number of each item were made by observation of each frequency display and also with 0.1 Hz display.

Condition of the result of calibration :

Item	Model	Serial No.	Cal No.	Due Date
1. Reference Standard Instruments				
1.1. Acceleration Transducer	3333A	9474001079	01-0012-21	10-Feb-22
1.2. Acceleration Transducer	3333A	9474001079	01-0012-21	10-Feb-22
1.3. Acceleration Transducer	3333A	9474001079	01-0012-21	10-Feb-22
1.4. Acceleration Transducer	3333A	9474001079	01-0012-21	10-Feb-22
1.5. Acceleration Transducer	3333A	9474001079	01-0012-21	10-Feb-22
1.6. Acceleration Transducer	3333A	9474001079	01-0012-21	10-Feb-22
1.7. Acceleration Transducer	3333A	9474001079	01-0012-21	10-Feb-22
1.8. Acceleration Transducer	3333A	9474001079	01-0012-21	10-Feb-22
1.9. Acceleration Transducer	3333A	9474001079	01-0012-21	10-Feb-22
1.10. Acceleration Transducer	3333A	9474001079	01-0012-21	10-Feb-22
1.11. Acceleration Transducer	3333A	9474001079	01-0012-21	10-Feb-22
1.12. Acceleration Transducer	3333A	9474001079	01-0012-21	10-Feb-22
1.13. Acceleration Transducer	3333A	9474001079	01-0012-21	10-Feb-22
1.14. Acceleration Transducer	3333A	9474001079	01-0012-21	10-Feb-22
1.15. Acceleration Transducer	3333A	9474001079	01-0012-21	10-Feb-22
1.16. Acceleration Transducer	3333A	9474001079	01-0012-21	10-Feb-22
1.17. Acceleration Transducer	3333A	9474001079	01-0012-21	10-Feb-22
1.18. Acceleration Transducer	3333A	9474001079	01-0012-21	10-Feb-22
1.19. Acceleration Transducer	3333A	9474001079	01-0012-21	10-Feb-22
1.20. Acceleration Transducer	3333A	9474001079	01-0012-21	10-Feb-22

2. The range of calibration was found accurate to three or four and five of calibration for this calibrated item only.

3. The calibration is traceable to the International system of unit (SI).

4. The calibration is traceable to the International system of unit (SI).

5. The calibration is traceable to the International system of unit (SI).

6. The calibration is traceable to the International system of unit (SI).

7. The calibration is traceable to the International system of unit (SI).

8. The calibration is traceable to the International system of unit (SI).

9. The calibration is traceable to the International system of unit (SI).

10. The calibration is traceable to the International system of unit (SI).

11. The calibration is traceable to the International system of unit (SI).

12. The calibration is traceable to the International system of unit (SI).

13. The calibration is traceable to the International system of unit (SI).

14. The calibration is traceable to the International system of unit (SI).

15. The calibration is traceable to the International system of unit (SI).

16. The calibration is traceable to the International system of unit (SI).

17. The calibration is traceable to the International system of unit (SI).

18. The calibration is traceable to the International system of unit (SI).

QP-1012-04-04-00004

T. Ratan

11. Overall condition

Measured value (dB)	Assigned Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
80.0	80.0	0.0	±1.3

12. High level stability

Frequency Weighting	Assigned Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
A-weight	107.9	107.9	0.0	±0.5

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor k = 2.  
or any value following calibration providing a level of confidence of approximately 95%.

End of Calibration Certificate

QP-1012-04-04-00005

T. Ratan

Summary of Measurement Result :

Parameter	Find	Deviation (dB)	Maximum permitted uncertainty of measurement (dB)
1. Absolute stability	✓	0.0	0.5
2. Self generated noise	✓	0.0	0.5
3. Accelerated signal rate of frequency weighting	✓	0.0	0.5
4. Random signal rate of frequency weighting	✓	0.0	0.5
5. Frequency and time weighting at 1 Hz	✓	0.0	0.5
6. Frequency and time weighting at 1 Hz	✓	0.0	0.5
7. Frequency and time weighting at 1 Hz	✓	0.0	0.5
8. Frequency and time weighting at 1 Hz	✓	0.0	0.5
9. Frequency and time weighting at 1 Hz	✓	0.0	0.5
10. Frequency and time weighting at 1 Hz	✓	0.0	0.5
11. Frequency and time weighting at 1 Hz	✓	0.0	0.5
12. Frequency and time weighting at 1 Hz	✓	0.0	0.5

QP-1012-04-04-00005

T. Ratan

Calibration Certificate

Equipment	Model	Serial No.	ID No.
80.0	80.0	80.0	80.0

Condition As Found :

Condition	Value	Unit
1. Ambient Temperature	23.0	°C
2. Relative Humidity	65.0	%
3. Barometric Pressure	1013.25	hPa
4. Calibration Date	15 OCT 2021	
5. Date of Issue	15 OCT 2021	

Condition As Found :

Condition	Value	Unit
1. Ambient Temperature	23.0	°C
2. Relative Humidity	65.0	%
3. Barometric Pressure	1013.25	hPa
4. Calibration Date	15 OCT 2021	
5. Date of Issue	15 OCT 2021	

Calibrated by :

Approved by :  
(Signature)

This certificate is issued in accordance with the requirements of ISO 9001:2015 standard and is valid only for the equipment and the test method specified in the scope of Calibration Certificate.

QP-1012-04-04-00006

T. Ratan

Result of calibration :

1. Absolute stability

Assigned Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
80.0	80.0	0.0	±1.3

2. Self generated noise

Assigned Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
80.0	80.0	0.0	±1.3

3. Accelerated signal rate of frequency weighting

Assigned Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
80.0	80.0	0.0	±1.3

4. Random signal rate of frequency weighting

Assigned Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
80.0	80.0	0.0	±1.3

5. Frequency and time weighting at 1 Hz

Assigned Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
80.0	80.0	0.0	±1.3

6. Frequency and time weighting at 1 Hz

Assigned Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
80.0	80.0	0.0	±1.3

7. Frequency and time weighting at 1 Hz

Assigned Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
80.0	80.0	0.0	±1.3

QP-1012-04-04-00006

T. Ratan

Cert. No. : A433119  
Job No. : VCM443(001)  
Page : 1 of 8

6. Electrical signal test of frequency weighting

Weighting network response with tolerance at 1.0%

Frequency (Hz)	Observed Value (dB)	Desired Value (dB)	Acceptance Limits
40	0.0	-0.1	-0.5
125	0.0	0.0	0.0
250	0.0	0.0	0.0
500	0.0	0.0	0.0
1000	0.0	0.0	0.0
2000	0.0	0.0	0.0
4000	0.0	0.0	0.0

6.1 Frequency and time weighting at 1 kHz

5.2 Time weighting at 1 kHz

Frequency Weighting	Observed Value (dB)	Desired Value (dB)	Acceptance Limits
A-weighting	0.0	0.0	0.0
C-weighting	0.0	0.0	0.0

5.2 Time weighting at 1 kHz

Frequency Weighting	Observed Value (dB)	Desired Value (dB)	Acceptance Limits
A-weighting	0.0	0.0	0.0
C-weighting	0.0	0.0	0.0

6. Long-term stability

Frequency Weighting	Observed Value (dB)	Desired Value (dB)	Acceptance Limits
A-weighting	0.0	0.0	0.0
C-weighting	0.0	0.0	0.0

GP-1023-04-04-00000

7. 2024-04-04

Cert. No. : A433121  
Job No. : VCM443(001)  
Page : 1 of 8

7. Level accuracy on the reference level

Frequency (Hz)	Observed Value (dB)	Desired Value (dB)	Acceptance Limits
40	0.0	-0.1	-0.5
125	0.0	0.0	0.0
250	0.0	0.0	0.0
500	0.0	0.0	0.0
1000	0.0	0.0	0.0
2000	0.0	0.0	0.0
4000	0.0	0.0	0.0

GP-1023-04-04-00000

7. 2024-04-04

Cert. No. : A433121  
Job No. : VCM443(001)  
Page : 1 of 8

14. Overall indication

Frequency Weighting	Observed Value (dB)	Desired Value (dB)	Acceptance Limits
A-weighting	0.0	0.0	0.0
C-weighting	0.0	0.0	0.0

15. High level stability

Frequency Weighting	Observed Value (dB)	Desired Value (dB)	Acceptance Limits
A-weighting	0.0	0.0	0.0
C-weighting	0.0	0.0	0.0

The required accuracy is based on a standard uncertainty multiplied by coverage factor k = 2 at any level following calibration providing a level of confidence of approximately 95 %

End of Calibration Certificate

GP-1023-04-04-00000

7. 2024-04-04

Cert. No. : A433120  
Job No. : VCM443(001)  
Page : 1 of 8

Calibration Certificate

**Equipment :** SINE LEVEL METER  
**Manufacturer :** KROON  
**Model :** SL-40  
**Serial No. :** 4004000 / 131177 (0122)  
**ID No. :** BSC\_100709

**Condition As Found :** GOOD

**Comments :** ALL LABORATORY GROUP (THAILAND) CO., LTD.  
100 PHA THIANAKARN 46 PHA THIANAKARN ROAD,  
KUPANG PRA THIANAKARN, KHEE SEAN LUMBO,  
BANGKOK, 10200 THAILAND.

**Location :** 1218 + 0.3 °N  
**Ambient Temperature :** 1 (0.3 ± 0.3) °C  
**Pressure :** 1 (0.1 ± 0.1) kPa  
**Relative Humidity :** 1 (0.1 ± 0.1) %

**Received Date :** 09 JUL 2021  
**Calibration Item :** 09 JUL 2021  
**Date of Issue :** 17 JUL 2021

**Calibrated by :** [Signature]  
**Approved by :** [Signature]

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced other than in full, except with the prior written approval of the head of Calibration Laboratory.

GP-1023-04-04-00000

7. 2024-04-04

Cert. No. : A433122  
Job No. : VCM443(001)  
Page : 1 of 8

8. Level accuracy including the level range control

Range	Observed Value (dB)	Desired Value (dB)	Acceptance Limits
0-10	0.0	0.0	0.0

8.1 Time level response

Time Weighting	Observed Value (dB)	Desired Value (dB)	Acceptance Limits
A-weighting	0.0	0.0	0.0
C-weighting	0.0	0.0	0.0

8.2 Peak level response

Frequency Weighting	Observed Value (dB)	Desired Value (dB)	Acceptance Limits
A-weighting	0.0	0.0	0.0
C-weighting	0.0	0.0	0.0

Frequency Weighting	Observed Value (dB)	Desired Value (dB)	Acceptance Limits
A-weighting	0.0	0.0	0.0
C-weighting	0.0	0.0	0.0

GP-1023-04-04-00000

7. 2024-04-04

Cert. No. : A433120  
Job No. : VCM443(001)  
Page : 1 of 8

Calibration Certificate

**Equipment :** SINE LEVEL METER  
**Manufacturer :** KROON  
**Model :** SL-40  
**Serial No. :** 4004000 / 131177 (0122)  
**ID No. :** BSC\_100709

**Condition As Found :** GOOD

**Comments :** ALL LABORATORY GROUP (THAILAND) CO., LTD.  
100 PHA THIANAKARN 46 PHA THIANAKARN ROAD,  
KUPANG PRA THIANAKARN, KHEE SEAN LUMBO,  
BANGKOK, 10200 THAILAND.

**Location :** 1218 + 0.3 °N  
**Ambient Temperature :** 1 (0.3 ± 0.3) °C  
**Pressure :** 1 (0.1 ± 0.1) kPa  
**Relative Humidity :** 1 (0.1 ± 0.1) %

**Received Date :** 09 JUL 2021  
**Calibration Item :** 09 JUL 2021  
**Date of Issue :** 17 JUL 2021

**Calibrated by :** [Signature]  
**Approved by :** [Signature]

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced other than in full, except with the prior written approval of the head of Calibration Laboratory.

GP-1023-04-04-00000

7. 2024-04-04



## Summary of Measurement Results:

Parameter	Pin	Full	Uncertainty (k=1)
1. Absolute sensitivity	✓	✓	0.2
2. Self-generated noise	✓	✓	N/A
3. Asynchronous signal rate of frequency weighting	✓	✓	0.5
4. Electrical signal rate of frequency weighting	✓	✓	0.5
5. Half generated noise	✓	✓	0.5
6. Level frequency on the reference level range	✓	✓	0.5
7. Level frequency on the reference level range	✓	✓	0.5
8. Level frequency on the reference level range	✓	✓	0.5
9. Level frequency on the reference level range	✓	✓	0.5
10. Level frequency on the reference level range	✓	✓	0.5
11. Level frequency on the reference level range	✓	✓	0.5
12. Level frequency on the reference level range	✓	✓	0.5

GP-1531-04-04-02004

GP-1531-04-04-02004

## 5. Level frequency on the reference level range

Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
10.0	0.0	±0.2
11.0	0.0	±0.2
12.0	0.0	±0.2
13.0	0.0	±0.2
14.0	0.0	±0.2
15.0	0.0	±0.2
16.0	0.0	±0.2
17.0	0.0	±0.2
18.0	0.0	±0.2
19.0	0.0	±0.2
20.0	0.0	±0.2
21.0	0.0	±0.2
22.0	0.0	±0.2
23.0	0.0	±0.2
24.0	0.0	±0.2
25.0	0.0	±0.2
26.0	0.0	±0.2
27.0	0.0	±0.2
28.0	0.0	±0.2
29.0	0.0	±0.2
30.0	0.0	±0.2

GP-1531-04-04-02004

GP-1531-04-04-02004

## Results of calibration:

## 1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
10.0 (dB)	10.0	0.0	±0.2

## 2. Self-generated noise

Measured Value (dB)
0.0

## 3. Asynchronous signal rate of frequency weighting

Frequency (Hz)	Measured Value (dB)
125	0.0
250	0.0
500	0.0
1000	0.0

## 4. Electrical signal rate of frequency weighting

Frequency (Hz)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
125	0.0	0.0	±0.2
250	0.0	0.0	±0.2
500	0.0	0.0	±0.2
1000	0.0	0.0	±0.2

GP-1531-04-04-02004

GP-1531-04-04-02004

## 6. Level frequency on the reference level range

Range	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
10.0	10.0	0.0	±0.2

## 7. Level frequency on the reference level range

Time (min)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
10.0	10.0	0.0	±0.2
20.0	10.0	0.0	±0.2
30.0	10.0	0.0	±0.2
40.0	10.0	0.0	±0.2
50.0	10.0	0.0	±0.2
60.0	10.0	0.0	±0.2
70.0	10.0	0.0	±0.2
80.0	10.0	0.0	±0.2
90.0	10.0	0.0	±0.2
100.0	10.0	0.0	±0.2

## 8. Peak C level

Number of cycles in test signal	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
10.0	10.0	0.0	±0.2
20.0	10.0	0.0	±0.2
30.0	10.0	0.0	±0.2
40.0	10.0	0.0	±0.2
50.0	10.0	0.0	±0.2
60.0	10.0	0.0	±0.2
70.0	10.0	0.0	±0.2
80.0	10.0	0.0	±0.2
90.0	10.0	0.0	±0.2
100.0	10.0	0.0	±0.2

GP-1531-04-04-02004

GP-1531-04-04-02004

## 4. Electrical signal rate of frequency weighting

Weighting network response with relation to 1 kHz

Frequency (Hz)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
125	0.0	0.0	±0.2
250	0.0	0.0	±0.2
500	0.0	0.0	±0.2
1000	0.0	0.0	±0.2
2000	0.0	0.0	±0.2
4000	0.0	0.0	±0.2
8000	0.0	0.0	±0.2

## 5. Frequency and time weighting at 1 kHz

5.1 Frequency weighting at 1 kHz

Frequency (Hz)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
125	0.0	0.0	±0.2
250	0.0	0.0	±0.2
500	0.0	0.0	±0.2
1000	0.0	0.0	±0.2

5.2 Time weighting at 1 kHz

Frequency (Hz)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
125	0.0	0.0	±0.2
250	0.0	0.0	±0.2
500	0.0	0.0	±0.2
1000	0.0	0.0	±0.2

## 6. Long-term stability

Frequency (Hz)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
125	0.0	0.0	±0.2
250	0.0	0.0	±0.2
500	0.0	0.0	±0.2
1000	0.0	0.0	±0.2

GP-1531-04-04-02004

GP-1531-04-04-02004

## 11. Overload indication

Measured value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
10.0	0.0	±0.2

## 12. High level stability

Frequency (Hz)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
125	0.0	0.0	±0.2
250	0.0	0.0	±0.2
500	0.0	0.0	±0.2
1000	0.0	0.0	±0.2

The specified uncertainty is based on a standard uncertainty multiplied by coverage factor k = 2, or any other value following calculation providing a level of confidence of approximately 95%.

End of Calibration Certificate

GP-1531-04-04-02004

GP-1531-04-04-02004



6. Level accuracy including the level range control

Range	Assigned Value (mm)	Measured Value (mm)	Deviation Value (mm)	Acceptance Limits (mm)
Sum	94.5	94.5	0.0	±0.3

7. Time base response

Time	Time base Weighting	Cycle	Assigned Value (mm)	Measured Value (mm)	Deviation Value (mm)	Acceptance Limits (mm)
First	8.25	1	100.0	97.9	-2.1	±0.3
First	2.00	8	117.9	116.9	-1.0	±0.3
First	2.00	8	134.9	134.9	0.0	±0.3
First	2.00	8	151.9	151.9	0.0	±0.3
First	2.00	8	168.9	168.9	0.0	±0.3
First	2.00	8	185.9	185.9	0.0	±0.3
First	2.00	8	202.9	202.9	0.0	±0.3

8. Peak C control level

Number of cycle in test signal	Assigned Value (mm)	Measured Value (mm)	Deviation Value (mm)	Acceptance Limits (mm)
One	154.4	154.4	0.0	±0.3

Number of cycle in test signal	Assigned Value (mm)	Measured Value (mm)	Deviation Value (mm)	Acceptance Limits (mm)
One	154.4	154.4	0.0	±0.3

GP 1512-04-00-0000

7. Rth

Calibration Report

Equipment : Sound Calibrator

Manufacturer : K&N

Model : 881117

Serial No. : 881117

Calibration Date : 17 June 2021

Relative Humidity : 23 ± 2 %

Relative Humidity : 50 ± 5 %

Method of Calibration : 1. Reference standard instrument

2. This certificate is issued by the responsible person of the laboratory

3. The certificate is valid for the period of 12 months

4. The certificate is valid for the period of 12 months

5. The certificate is valid for the period of 12 months

6. The certificate is valid for the period of 12 months

7. The certificate is valid for the period of 12 months

8. The certificate is valid for the period of 12 months

9. The certificate is valid for the period of 12 months

10. The certificate is valid for the period of 12 months

11. The certificate is valid for the period of 12 months

12. The certificate is valid for the period of 12 months

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14. The certificate is valid for the period of 12 months

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31. The certificate is valid for the period of 12 months

32. The certificate is valid for the period of 12 months

33. The certificate is valid for the period of 12 months

34. The certificate is valid for the period of 12 months

Page 2 of 2

A/CAL/001

11. Overall stability

Assigned Value (mm)	Measured Value (mm)	Deviation Value (mm)	Acceptance Limits (mm)
88.7	88.7	0.0	±0.3

12. High level stability

Frequency Weighting	Assigned Value (mm)	Measured Value (mm)	Deviation Value (mm)	Acceptance Limits (mm)
A-weight	177.9	177.9	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor k = 2  
in any other following calibration providing a level of confidence of approximately 95%

End of Calibration Certificate

GP 1512-04-00-0000

7. Rth

Calibration Report

Equipment : Sound Calibrator

Manufacturer : K&N

Model : 881117

Serial No. : 881117

Calibration Date : 17 June 2021

Relative Humidity : 23 ± 2 %

Relative Humidity : 50 ± 5 %

Method of Calibration : 1. Reference standard instrument

2. This certificate is issued by the responsible person of the laboratory

3. The certificate is valid for the period of 12 months

4. The certificate is valid for the period of 12 months

5. The certificate is valid for the period of 12 months

6. The certificate is valid for the period of 12 months

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23. The certificate is valid for the period of 12 months

24. The certificate is valid for the period of 12 months

25. The certificate is valid for the period of 12 months

26. The certificate is valid for the period of 12 months

27. The certificate is valid for the period of 12 months

28. The certificate is valid for the period of 12 months

29. The certificate is valid for the period of 12 months

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31. The certificate is valid for the period of 12 months

32. The certificate is valid for the period of 12 months

33. The certificate is valid for the period of 12 months

34. The certificate is valid for the period of 12 months

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A/CAL/001

Calibration Certificate

Equipment	Manufacturer	Model/Type	Serial No.	ID No.	Calibration Date	Calibrated by
Sound Calibrator	K&N	881117	881117	881117	17 June 2021	Mr. Sittichai Pongthong



Approved by : Mr. Sittichai Pongthong

Signature : Mr. Sittichai Pongthong

Position : Head of Calibration Laboratory

Address : 100 Phatthana Road, Phatthana Road, Bangkok 10110 Thailand

Received Date : 18 March 2021

Calibrated Date : 24 March 2021

Issued Date : 25 March 2021

Calibrated by : Mr. Sittichai Pongthong

Approved by : Mr. Sittichai Pongthong

Signature : Mr. Sittichai Pongthong

Position : Head of Calibration Laboratory

Address : 100 Phatthana Road, Phatthana Road, Bangkok 10110 Thailand

Received Date : 18 March 2021

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Issued Date : 25 March 2021

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Approved by : Mr. Sittichai Pongthong

Signature : Mr. Sittichai Pongthong

Position : Head of Calibration Laboratory

Address : 100 Phatthana Road, Phatthana Road, Bangkok 10110 Thailand

Received Date : 18 March 2021

Calibrated Date : 24 March 2021

Issued Date : 25 March 2021

Calibrated by





11. Overload stability

Measured value (dB)	Deviation	Acceptance
Positive	Value	Limit
100.0	0.0	+0.5

12. High level stability

Frequency	SLM Display	Deviation	Acceptance
125 Hz	Value	Limit	
1000 Hz	Value	Limit	
8000 Hz	Value	Limit	

This report is generated based on a standard uncertainty multiplied by coverage factor k = 2  
at 95% confidence level (approximately 95%)

End of Calibration Certificate

Calibration Certificate

Equipment :  
Manufacturer :  
Model :  
Serial No. :  
ID No. :

Condition As Found :  
Customer :  
Location :  
Ambient Temperature :  
Pressure :  
Relative Humidity :  
Received Date :  
Calibration Due :  
Date of Issue :

Calibrated by :  
Approved by :  
Thailand (Thailand) :

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, and has been signed  
after due to full, except with the prior written approval of the head of Calibration Laboratory

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based on IEC-60725-1 (2013) Standard for sound level meter (SLM).  
The SLM had test to Acoustical and Electrical signal tests of frequency weighting with Acoustic chamber and Reference  
Standard Instruments.  
For test results of each item were made by observation of each instrument display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	M748017016	EP-0012-21	10-Feb-22
Waveform Generator	33511B	M75202742	EP-0011-21	10-Feb-22
Digital Multimeter	3441A	M753220104	BEI-000094	10-Feb-22
Digital Multimeter	3446A	M753220104	BEI-000094	10-Feb-22
Digital Multimeter	3446A	M753220104	BEI-000094	10-Feb-22
Programmer	M753220104	M753220104	BEI-000094	10-Feb-22
Customer Multimeter	M753220104	M753220104	BEI-000094	10-Feb-22
Customer Multimeter	M753220104	M753220104	BEI-000094	10-Feb-22
Measuring Amplifier	NA-425A1	3456095	AA-3002-21	16-Feb-22

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.

3. This certificate is traceable to the international system of unit maintained at :

3.1 National Institute of Metrology (Thailand).

3.2 Thailand Institute of Scientific and Technological Research (TISTR).

Summary of Measurement Result:

Parameter	Pass	Fail	Uncertainty	Maximum-permitted
1. Absolute sensitivity	✓	✓	0.2	N/A
2. Self-generated noise	✓	✓	0.3	0.6
3. Acoustical signal tests of frequency weightings	✓	✓	0.3	0.6
4. Electrical signal tests of frequency weightings	✓	✓	0.3	0.6
5. Frequency and time weightings at 1 kHz	✓	✓	0.2	0.2
6. Long-term stability	✓	✓	0.1	0.1
7. Level linearity on the reference level range	✓	✓	0.2	0.3
8. Level linearity including the level range control	✓	✓	0.2	0.3
9. Tone burst response	✓	✓	0.2	0.3
10. Peak C sound level	✓	✓	0.2	0.3
11. Overload indication	✓	✓	0.2	0.25
12. High level stability	✓	✓	0.1	0.1

Result of calibration:

1. Absolute sensitivity

Reference	Measured	Deviation	Acceptance
Acoustic Signal	Value	(dB)	Limit
93.9 (93.9)	93.9	0.0	±0.3

2. Self-generated noise

Measured Value
(dB)
16.1

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency	Measured value
Weighting	(dB)
A-weight	11.6
C-weight	17.8
Flat	23.6

3. Acoustical signal tests of frequency weightings

Mean free-field acoustic response at a level of 84 dB

Frequency	Flat	C-weight	A-weight	Acceptance
125	0.3	0.4	0.3	±1.2
1000	0.0	0.0	0.0	±1.0
8000	0.3	0.5	0.5	±2.0

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	-0.1	-0.1	±2.0
125	0.0	0.0	-0.1	±1.5
250	0.0	-0.1	-0.1	±1.5
500	0.1	0.0	-0.1	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.1	0.0	0.0	±2.0
4000	0.1	0.0	0.0	±2.0
8000	0.1	0.0	0.0	±2.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency	Measured	Deviation	Acceptance
Weighting	Value	(dB)	Limit
A-weight	93.9	0.0	±0.2
C-weight	94.0	0.0	±0.2
Flat	93.9	0.0	±0.2

5.2 Time weighting at 1 kHz

Frequency	Measured	Deviation	Acceptance
Weighting	Value	(dB)	Limit
Flat	93.9	0.0	±0.1
Slow	93.9	0.0	±0.1
Log	93.9	0.0	±0.1

6. Long-term stability

Frequency	SLM Display	Deviation	Acceptance
Weighting	at initial	Value	Limit
A-weight	94.0	94.1	±0.1



7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
136.0	136.1	0.1	±1.1
135.0	135.1	0.1	±1.1
134.0	134.1	0.1	±1.1
133.0	133.0	0.0	±1.1
132.0	132.0	0.0	±1.1
131.0	131.0	0.0	±1.1
129.0	129.0	0.0	±1.1
124.0	124.0	0.0	±1.1
119.0	119.1	0.1	±1.1
114.0	114.1	0.1	±1.1
109.0	109.1	0.1	±1.1
104.0	104.1	0.1	±1.1
99.0	99.1	0.1	±1.1
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.0	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	39.0	0.0	±1.1
34.0	34.0	0.0	±1.1
30.0	29.9	-0.1	±1.1
29.0	28.9	-0.1	±1.1
28.0	27.9	-0.1	±1.1
27.0	27.0	0.0	±1.1
26.0	26.0	0.0	±1.1
25.0	24.9	-0.1	±1.1

QP-TS10-04-02066

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Th (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ~ -5.0
	2	8	117.0	116.9	-0.1	1.0 ~ -2.5
Slow	200	800	134.0	134.0	0.0	±1.0
	2	8	108.0	108.0	0.0	1.5 ~ -5.0
SEL	0.25	1	99.0	98.8	-0.2	1.5 ~ -5.0
	2	8	108.0	107.9	-0.1	1.0 ~ -2.5

10. Peak C count level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
One	136.4	136.4	0.0	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

QP-TS10-04-02066

Calibration Certificate

Equipment : SOUND LEVEL METER  
Manufacturer :  
Model : H&Z Mergelund (N-32) / Prosonic 980-24  
Serial No. : H017179 / 18002 / (8417)  
ID No. : H&Z\_70000

Condition As Found :  
Comments :  
Location :  
Audience Temperature : (21.0 ± 0.1) °C  
Pressure : (1013 ± 0.1) hPa  
Relative Humidity : (60 ± 3) %  
Received Date : 08 AUGUST 2021  
Calibration Date : 08 AUGUST 2021  
Date of Issue :

Calibrated by :  
Approved by :  
(Thailand Professional)

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard. Any use or reproduction of this certificate without the prior written approval of the head of Calibration is prohibited.

QP-TS10-04-02066

11. Overload indication

Measured value (dB)	Observed Value (dB)	Acceptance Limits (dB)
Positive one half cycle	89.6	±1.3
Negative one half cycle	89.6	±1.3

12. High level stability

Frequency Weighting	SLR Display at initial	SLR Display at half cycle	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	117.0	117.0	0.0	±1.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor k = 2  
on any value following calibration providing a level of confidence of approximately 95 %

End of Calibration Certificate

QP-TS10-04-02066

Summary of Measurement Result:

Parameter	Pass	Fail	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	✓	-	0.2	N/A
2. Self-generated noise	✓	-	0.2	N/A
3. Acoustical signal test of frequency weightings	✓	-	0.3	0.6
125 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.7
4. Electrical signal test of frequency weightings	✓	-	0.3	0.6
For 10 Hz to 4 kHz	✓	-	0.3	0.7
For > 10 kHz to 10 kHz	✓	-	0.2	0.2
5. Frequency and time weighting at 1 kHz	✓	-	0.1	0.1
6. Long-term stability	✓	-	0.2	0.3
7. Level linearity on the reference level range	✓	-	0.2	0.3
8. Level linearity including the level range control	✓	-	0.2	0.3
9. Tone burst response	✓	-	0.2	0.35
10. Peak C count level	✓	-	0.2	0.25
11. Overload indication	✓	-	0.1	0.1
12. High level stability	✓	-	0.1	0.1

QP-TS10-04-02066

Continuation of Calibration Certificate

Cert. No. : ACL21083  
Job No. : VCS44C060  
Page : 4 of 8

Result of calibration 1.

1. Absolute sensitivity

Reference Acoustic Signal	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.9)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
15.1

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Measured value (dB)
A-weight	12.0
C-weight	18.1
Flat	23.9

3. Acoustical signal tests of frequency weightings

3.1 Meter free-field acoustic response at a level of 94 dB

Frequency (Hz)	Flat	C-weight	A-weight	Deviation from various frequency weighting response curve (dB)	Acceptance Limits
125	0.2	0.3	0.3	0.3	±1.5
1000	0.0	0.0	0.0	0.0	±1.0
2000	0.7	0.8	0.8	0.8	±2.0

QP-7522-04-04-020604

Continuation of Calibration Certificate

Cert. No. : ACL21083  
Job No. : VCS44C060  
Page : 7 of 8

8. Level accuracy including the best range control

Range	Accepted Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
Audio	94.0	94.0	0.0	±1.1

9. Time base response

Time Weighting	Frequency (Hz)	Accepted Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
Fast	125	119.0	119.0	0.0	±2.1
Fast	1000	117.0	117.0	0.0	±2.1
Slow	125	119.0	119.0	0.0	±2.1
Slow	1000	117.0	117.0	0.0	±2.1
Flat	125	119.0	119.0	0.0	±2.1
Flat	1000	117.0	117.0	0.0	±2.1

10. Peak C sound level

Number of cycle in test signal	Accepted Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
One	136.4	136.2	-0.2	±3.0

QP-7522-04-04-020604

Continuation of Calibration Certificate

Cert. No. : ACL21083  
Job No. : VCS44C060  
Page : 5 of 8

4. Electrical signal tests of frequency weightings

4.1 Weighting network response relative to 1 kHz

Frequency (Hz)	Flat	C-weight	A-weight	Deviation from various frequency weighting response curve (dB)	Acceptance Limits
63	-0.1	-0.1	-0.1	-0.1	±2.0
125	0.0	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	0.0	±1.5
500	0.0	0.1	0.0	0.0	±1.5
1000	0.0	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.0	0.0	±2.0
4000	0.0	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
A-weight	94.0	0.0	±0.2
C-weight	94.0	0.0	±0.2
Flat	94.0	0.0	±0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	±0.1
Slow	94.0	0.0	±0.1
Leq	94.0	0.0	±0.1

6. Long-term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviation Value (dB)	Acceptance Limits (dB)
A-weight	94.0	94.0	0.0	±0.3

QP-7522-04-04-020604

Continuation of Calibration Certificate

Cert. No. : ACL21083  
Job No. : VCS44C060  
Page : 6 of 8

11. Overload indication

Measurement Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	89.6	0.0
Negative one-half cycle	89.6	0.0

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviation Value (dB)	Acceptance Limits (dB)
A-weight	137.0	137.1	-0.1	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor k = 2 or any value following calculation providing a level of confidence of approximately 95 %

End of Calibration Certificate

QP-7522-04-04-020604

Continuation of Calibration Certificate

Cert. No. : ACL21083  
Job No. : VCS44C060  
Page : 6 of 8

5. Level accuracy on the reference level range

Accepted Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
127.0	127.0	0.0	±1.1
136.0	136.0	0.0	±1.1
137.0	137.0	0.0	±1.1
138.0	138.0	0.0	±1.1
139.0	139.0	0.0	±1.1
140.0	140.0	0.0	±1.1
141.0	141.0	0.0	±1.1
142.0	142.0	0.0	±1.1
143.0	143.0	0.0	±1.1
144.0	144.0	0.0	±1.1
145.0	145.0	0.0	±1.1
146.0	146.0	0.0	±1.1
147.0	147.0	0.0	±1.1
148.0	148.0	0.0	±1.1
149.0	149.0	0.0	±1.1
150.0	150.0	0.0	±1.1
151.0	151.0	0.0	±1.1
152.0	152.0	0.0	±1.1
153.0	153.0	0.0	±1.1
154.0	154.0	0.0	±1.1
155.0	155.0	0.0	±1.1
156.0	156.0	0.0	±1.1
157.0	157.0	0.0	±1.1
158.0	158.0	0.0	±1.1
159.0	159.0	0.0	±1.1
160.0	160.0	0.0	±1.1
161.0	161.0	0.0	±1.1
162.0	162.0	0.0	±1.1
163.0	163.0	0.0	±1.1
164.0	164.0	0.0	±1.1
165.0	165.0	0.0	±1.1
166.0	166.0	0.0	±1.1
167.0	167.0	0.0	±1.1
168.0	168.0	0.0	±1.1
169.0	169.0	0.0	±1.1
170.0	170.0	0.0	±1.1
171.0	171.0	0.0	±1.1
172.0	172.0	0.0	±1.1
173.0	173.0	0.0	±1.1
174.0	174.0	0.0	±1.1
175.0	175.0	0.0	±1.1
176.0	176.0	0.0	±1.1
177.0	177.0	0.0	±1.1
178.0	178.0	0.0	±1.1
179.0	179.0	0.0	±1.1
180.0	180.0	0.0	±1.1
181.0	181.0	0.0	±1.1
182.0	182.0	0.0	±1.1
183.0	183.0	0.0	±1.1
184.0	184.0	0.0	±1.1
185.0	185.0	0.0	±1.1
186.0	186.0	0.0	±1.1
187.0	187.0	0.0	±1.1
188.0	188.0	0.0	±1.1
189.0	189.0	0.0	±1.1
190.0	190.0	0.0	±1.1
191.0	191.0	0.0	±1.1
192.0	192.0	0.0	±1.1
193.0	193.0	0.0	±1.1
194.0	194.0	0.0	±1.1
195.0	195.0	0.0	±1.1
196.0	196.0	0.0	±1.1
197.0	197.0	0.0	±1.1
198.0	198.0	0.0	±1.1
199.0	199.0	0.0	±1.1
200.0	200.0	0.0	±1.1
201.0	201.0	0.0	±1.1
202.0	202.0	0.0	±1.1
203.0	203.0	0.0	±1.1
204.0	204.0	0.0	±1.1
205.0	205.0	0.0	±1.1
206.0	206.0	0.0	±1.1
207.0	207.0	0.0	±1.1
208.0	208.0	0.0	±1.1
209.0	209.0	0.0	±1.1
210.0	210.0	0.0	±1.1
211.0	211.0	0.0	±1.1
212.0	212.0	0.0	±1.1
213.0	213.0	0.0	±1.1
214.0	214.0	0.0	±1.1
215.0	215.0	0.0	±1.1
216.0	216.0	0.0	±1.1
217.0	217.0	0.0	±1.1
218.0	218.0	0.0	±1.1
219.0	219.0	0.0	±1.1
220.0	220.0	0.0	±1.1
221.0	221.0	0.0	±1.1
222.0	222.0	0.0	±1.1
223.0	223.0	0.0	±1.1
224.0	224.0	0.0	±1.1
225.0	225.0	0.0	±1.1
226.0	226.0	0.0	±1.1
227.0	227.0	0.0	±1.1
228.0	228.0	0.0	±1.1
229.0	229.0	0.0	±1.1
230.0	230.0	0.0	±1.1
231.0	231.0	0.0	±1.1
232.0	232.0	0.0	±1.1
233.0	233.0	0.0	±1.1
234.0	234.0	0.0	±1.1
235.0	235.0	0.0	±1.1
236.0	236.0	0.0	±1.1
237.0	237.0	0.0	±1.1
238.0	238.0	0.0	±1.1
239.0	239.0	0.0	±1.1
240.0	240.0	0.0	±1.1
241.0	241.0	0.0	±1.1
242.0	242.0	0.0	±1.1
243.0	243.0	0.0	±1.1
244.0	244.0	0.0	±1.1
245.0	245.0	0.0	±1.1
246.0	246.0	0.0	±1.1
247.0	247.0	0.0	±1.1
248.0	248.0	0.0	±1.1
249.0	249.0	0.0	±1.1
250.0	250.0	0.0	±1.1
251.0	251.0	0.0	±1.1
252.0	252.0	0.0	±1.1
253.0	253.0	0.0	±1.1
254.0	254.0	0.0	±1.1
255.0	255.0	0.0	±1.1
256.0	256.0	0.0	±1.1
257.0	257.0	0.0	±1.1
258.0	258.0	0.0	±1.1
259.0	259.0	0.0	±1.1
260.0	260.0	0.0	±1.1
261.0	261.0	0.0	±1.1
262.0	262.0	0.0	±1.1
263.0	263.0	0.0	±1.1
264.0	264.0	0.0	±1.1
265.0	265.0	0.0	±1.1
266.0	266.0	0.0	±1.1
267.0	267.0	0.0	±1.1
268.0	268.0	0.0	±1.1
269.0	269.0	0.0	±1.1
270.0	270.0	0.0	±1.1
271.0	271.0	0.0	±1.1
272.0	272.0	0.0	±1.1
273.0	273.0	0.0	±1.1
274.0	274.0	0.0	±1.1
275.0	275.0	0.0	±1.1
276.0	276.0	0.0	±1.1
277.0	277.0	0.0	±1.1
278.0	278.0	0.0	±1.1
279.0	279.0	0.0	±1.1
280.0	280.0	0.0	±1.1
281.0	281.0	0.0	±1.1
282.0	282.0	0.0	±1.1
283.0	283.0	0.0	±1.1
284.0	284.0	0.0	±1.1
285.0	285.0	0.0	±1.1
286.0	286.0	0.0	±1.1
287.0	287.0	0.0	±1.1
288.0	288.0	0.0	±1.1
289.0	289.0	0.0	±1.1
290.0	290.0	0.0	±1.1
291.0	291.0	0.0	±1.1
292.0	292.0	0.0	±1.1
293.0	293.0	0.0	±1.1
294.0	294.0	0.0	±1.1
295.0	295.0	0.0	±1.1
296.0	296.0	0.0	±1.1
297.0	297.0	0.0	±1.1
298.0	298.0	0.0	±1.1
299.0	299.0	0.0	±1.1
300.0	300.0	0.0	±1.1
301.0	301.0	0.0	±1.1
302.0	302.0	0.0	±1.1
303.0	303.0	0.0	±1.1
304.0	304.0	0.0	±1.1
305.0	305.0	0.0	±1.1
306.0	306.0	0.0	±1.1
307.0	307.0	0.0	±1.1
308.0	308.0	0.0	±1.1
309.0	309.0	0.0	±1.1
310.0	310.0	0.0	±1.1









Continuation of Calibration Certificate

Result of calibration:

1. Absolute instability

Frequency (Hz)	Measured Value (dB)	Decoded Value (dB)	Assignment Limits (dB)
100	100.0	100.0	±0.1

2. Self-generated noise

2.1 Thermal noise

Measured Value (dB)
100.0

2.2 The uncertainty of the stated level noise was explained by electrical signal-to-noise ratio

Frequency (Hz)	Measured Value (dB)	Decoded Value (dB)	Assignment Limits (dB)
100	100.0	100.0	±0.1

3. Accumulated signal noise of frequency weighting

3.1 Thermal noise

Frequency (Hz)	Measured Value (dB)	Decoded Value (dB)	Assignment Limits (dB)
100	100.0	100.0	±0.1

GP 1012 (4-4-4) (4-4-4)

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Continuation of Calibration Certificate

4. Level instability including the level range error

Frequency (Hz)	Measured Value (dB)	Decoded Value (dB)	Assignment Limits (dB)
100	100.0	100.0	±0.1

5. Time base response

Time Weighting	Frequency (Hz)	Measured Value (dB)	Decoded Value (dB)	Assignment Limits (dB)
100	100.0	100.0	100.0	±0.1

6. Peak C-weight level

Frequency (Hz)	Measured Value (dB)	Decoded Value (dB)	Assignment Limits (dB)
100	100.0	100.0	±0.1

GP 1012 (4-4-4) (4-4-4)

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Continuation of Calibration Certificate

7. Electrical signal noise of frequency weighting

7.1 Thermal noise

Frequency (Hz)	Measured Value (dB)	Decoded Value (dB)	Assignment Limits (dB)
100	100.0	100.0	±0.1

7.2 The uncertainty of the stated level noise was explained by electrical signal-to-noise ratio

Frequency (Hz)	Measured Value (dB)	Decoded Value (dB)	Assignment Limits (dB)
100	100.0	100.0	±0.1

8. Long-term stability

Frequency (Hz)	Measured Value (dB)	Decoded Value (dB)	Assignment Limits (dB)
100	100.0	100.0	±0.1

GP 1012 (4-4-4) (4-4-4)

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Continuation of Calibration Certificate

9. Electrical instability

Frequency (Hz)	Measured Value (dB)	Decoded Value (dB)	Assignment Limits (dB)
100	100.0	100.0	±0.1

10. High level stability

Frequency (Hz)	Measured Value (dB)	Decoded Value (dB)	Assignment Limits (dB)
100	100.0	100.0	±0.1

11. Self-generated noise

Frequency (Hz)	Measured Value (dB)	Decoded Value (dB)	Assignment Limits (dB)
100	100.0	100.0	±0.1

GP 1012 (4-4-4) (4-4-4)

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Continuation of Calibration Certificate

12. Level instability on the reference level range

Frequency (Hz)	Measured Value (dB)	Decoded Value (dB)	Assignment Limits (dB)
100	100.0	100.0	±0.1

GP 1012 (4-4-4) (4-4-4)

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Continuation of Calibration Certificate

Calibration Certificate

Equipment : SITHIPORN SITHIPORN ASSOCIATES CO.LTD  
Model : SITHIPORN SITHIPORN ASSOCIATES CO.LTD  
Serial No. : SITHIPORN SITHIPORN ASSOCIATES CO.LTD  
ID No. : SITHIPORN SITHIPORN ASSOCIATES CO.LTD

Condition As Found : SITHIPORN SITHIPORN ASSOCIATES CO.LTD  
Condition As Left : SITHIPORN SITHIPORN ASSOCIATES CO.LTD

Location : SITHIPORN SITHIPORN ASSOCIATES CO.LTD  
Ambient Temperature : SITHIPORN SITHIPORN ASSOCIATES CO.LTD  
Pressure : SITHIPORN SITHIPORN ASSOCIATES CO.LTD  
Relative Humidity : SITHIPORN SITHIPORN ASSOCIATES CO.LTD

Received Date : SITHIPORN SITHIPORN ASSOCIATES CO.LTD  
Calibration Due : SITHIPORN SITHIPORN ASSOCIATES CO.LTD  
Date of Issue : SITHIPORN SITHIPORN ASSOCIATES CO.LTD

Calibrated by : SITHIPORN SITHIPORN ASSOCIATES CO.LTD  
Approved by : SITHIPORN SITHIPORN ASSOCIATES CO.LTD

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, and may not be reproduced without the prior written approval of the head of Calibration Laboratory.

GP 1012 (4-4-4) (4-4-4)

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Calibration Procedures :

Calibration Method :

This equipment was calibrated by using the REC-4850/12015 Standard for model level meter (N.M.I.).  
The N.M.I. had trace to International and Electrical signal rate of frequency weighting with Sillhorns standards and Reference Standard Instruments.

For more details of each item were made by photograph of each instrument display and item with N.M.I. display.

Condition of the result of calibration :

3.1 National Standard Instruments

Instrument	Model	Serial No.	Exp. No.	Due Date
Reference Oscilloscope	33220A	40540017076	09/06/22	09/06/22
Reference Oscilloscope	33414A	40540017076	09/06/22	09/06/22
Signal Multimeter	3380A	40540017076	09/06/22	09/06/22
Signal Multimeter	3440A	40540017076	09/06/22	09/06/22
Programmable Oscilloscope	MAX1070	42180114	10/07/22	10/07/22
Reference Oscilloscope	4100	2077040	09/06/22	09/06/22
Measuring Amplifier	NA-420A	30100401	09/06/22	09/06/22

3.2 The result of calibration was found accurate as shown on date and place of calibration with the calibrated instrument.

3.3 This certificate is transferable to the instrument system of use mentioned at :

3.3.1 National Institute of Standards and Technology (NIST)

3.3.2 Thailand Institute of Standards and Technology (TIS)

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4. Electrical signal rate of frequency weighting

Weighting network response with reference to 1 kHz.

Frequency (Hz)	Decimated Value	Measured Value	Accepted Value
47	0.1	0.1	0.1
125	0.5	0.5	0.5
250	0.5	0.5	0.5
500	0.5	0.5	0.5
1000	0.5	0.5	0.5
2000	0.5	0.5	0.5
4000	0.5	0.5	0.5
8000	0.5	0.5	0.5

5. Frequency and time weighting at 1 kHz

3.1 Frequency weighting at 1 kHz

Frequency Weighting	Decimated Value	Measured Value	Accepted Value
1/10	0.1	0.1	0.1
1/100	0.01	0.01	0.01
1/1000	0.001	0.001	0.001
1/10000	0.0001	0.0001	0.0001

3.2 Time weighting at 1 kHz

Frequency Weighting	Decimated Value	Measured Value	Accepted Value
1/10	0.1	0.1	0.1
1/100	0.01	0.01	0.01
1/1000	0.001	0.001	0.001
1/10000	0.0001	0.0001	0.0001

6. Long term stability

Frequency Weighting	Decimated Value	Measured Value	Accepted Value
1/10	0.1	0.1	0.1
1/100	0.01	0.01	0.01
1/1000	0.001	0.001	0.001
1/10000	0.0001	0.0001	0.0001

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Summary of Measurement Result :

Parameter	Unit	Value	Maximum permitted uncertainty of measurement (MPE)
1. Absolute stability	dB	0.2	0.5
2. Self generated noise	dB	0.2	0.5
3. Frequency and time weighting at 1 kHz	dB	0.2	0.5
4. Electrical signal rate of frequency weighting	dB	0.2	0.5
5. Frequency and time weighting at 1 kHz	dB	0.2	0.5
6. Frequency and time weighting at 1 kHz	dB	0.2	0.5
7. Frequency and time weighting at 1 kHz	dB	0.2	0.5
8. Frequency and time weighting at 1 kHz	dB	0.2	0.5
9. Frequency and time weighting at 1 kHz	dB	0.2	0.5
10. Frequency and time weighting at 1 kHz	dB	0.2	0.5
11. Frequency and time weighting at 1 kHz	dB	0.2	0.5
12. Frequency and time weighting at 1 kHz	dB	0.2	0.5
13. Frequency and time weighting at 1 kHz	dB	0.2	0.5
14. Frequency and time weighting at 1 kHz	dB	0.2	0.5
15. Frequency and time weighting at 1 kHz	dB	0.2	0.5
16. Frequency and time weighting at 1 kHz	dB	0.2	0.5
17. Frequency and time weighting at 1 kHz	dB	0.2	0.5
18. Frequency and time weighting at 1 kHz	dB	0.2	0.5
19. Frequency and time weighting at 1 kHz	dB	0.2	0.5
20. Frequency and time weighting at 1 kHz	dB	0.2	0.5
21. Frequency and time weighting at 1 kHz	dB	0.2	0.5
22. Frequency and time weighting at 1 kHz	dB	0.2	0.5
23. Frequency and time weighting at 1 kHz	dB	0.2	0.5
24. Frequency and time weighting at 1 kHz	dB	0.2	0.5
25. Frequency and time weighting at 1 kHz	dB	0.2	0.5
26. Frequency and time weighting at 1 kHz	dB	0.2	0.5
27. Frequency and time weighting at 1 kHz	dB	0.2	0.5
28. Frequency and time weighting at 1 kHz	dB	0.2	0.5
29. Frequency and time weighting at 1 kHz	dB	0.2	0.5
30. Frequency and time weighting at 1 kHz	dB	0.2	0.5
31. Frequency and time weighting at 1 kHz	dB	0.2	0.5
32. Frequency and time weighting at 1 kHz	dB	0.2	0.5
33. Frequency and time weighting at 1 kHz	dB	0.2	0.5
34. Frequency and time weighting at 1 kHz	dB	0.2	0.5
35. Frequency and time weighting at 1 kHz	dB	0.2	0.5
36. Frequency and time weighting at 1 kHz	dB	0.2	0.5
37. Frequency and time weighting at 1 kHz	dB	0.2	0.5
38. Frequency and time weighting at 1 kHz	dB	0.2	0.5
39. Frequency and time weighting at 1 kHz	dB	0.2	0.5
40. Frequency and time weighting at 1 kHz	dB	0.2	0.5
41. Frequency and time weighting at 1 kHz	dB	0.2	0.5
42. Frequency and time weighting at 1 kHz	dB	0.2	0.5
43. Frequency and time weighting at 1 kHz	dB	0.2	0.5
44. Frequency and time weighting at 1 kHz	dB	0.2	0.5
45. Frequency and time weighting at 1 kHz	dB	0.2	0.5
46. Frequency and time weighting at 1 kHz	dB	0.2	0.5
47. Frequency and time weighting at 1 kHz	dB	0.2	0.5
48. Frequency and time weighting at 1 kHz	dB	0.2	0.5
49. Frequency and time weighting at 1 kHz	dB	0.2	0.5
50. Frequency and time weighting at 1 kHz	dB	0.2	0.5
51. Frequency and time weighting at 1 kHz	dB	0.2	0.5
52. Frequency and time weighting at 1 kHz	dB	0.2	0.5
53. Frequency and time weighting at 1 kHz	dB	0.2	0.5
54. Frequency and time weighting at 1 kHz	dB	0.2	0.5
55. Frequency and time weighting at 1 kHz	dB	0.2	0.5
56. Frequency and time weighting at 1 kHz	dB	0.2	0.5
57. Frequency and time weighting at 1 kHz	dB	0.2	0.5
58. Frequency and time weighting at 1 kHz	dB	0.2	0.5
59. Frequency and time weighting at 1 kHz	dB	0.2	0.5
60. Frequency and time weighting at 1 kHz	dB	0.2	0.5
61. Frequency and time weighting at 1 kHz	dB	0.2	0.5
62. Frequency and time weighting at 1 kHz	dB	0.2	0.5
63. Frequency and time weighting at 1 kHz	dB	0.2	0.5
64. Frequency and time weighting at 1 kHz	dB	0.2	0.5
65. Frequency and time weighting at 1 kHz	dB	0.2	0.5
66. Frequency and time weighting at 1 kHz	dB	0.2	0.5
67. Frequency and time weighting at 1 kHz	dB	0.2	0.5
68. Frequency and time weighting at 1 kHz	dB	0.2	0.5
69. Frequency and time weighting at 1 kHz	dB	0.2	0.5
70. Frequency and time weighting at 1 kHz	dB	0.2	0.5
71. Frequency and time weighting at 1 kHz	dB	0.2	0.5
72. Frequency and time weighting at 1 kHz	dB	0.2	0.5
73. Frequency and time weighting at 1 kHz	dB	0.2	0.5
74. Frequency and time weighting at 1 kHz	dB	0.2	0.5
75. Frequency and time weighting at 1 kHz	dB	0.2	0.5
76. Frequency and time weighting at 1 kHz	dB	0.2	0.5
77. Frequency and time weighting at 1 kHz	dB	0.2	0.5
78. Frequency and time weighting at 1 kHz	dB	0.2	0.5
79. Frequency and time weighting at 1 kHz	dB	0.2	0.5
80. Frequency and time weighting at 1 kHz	dB	0.2	0.5
81. Frequency and time weighting at 1 kHz	dB	0.2	0.5
82. Frequency and time weighting at 1 kHz	dB	0.2	0.5
83. Frequency and time weighting at 1 kHz	dB	0.2	0.5
84. Frequency and time weighting at 1 kHz	dB	0.2	0.5
85. Frequency and time weighting at 1 kHz	dB	0.2	0.5
86. Frequency and time weighting at 1 kHz	dB	0.2	0.5
87. Frequency and time weighting at 1 kHz	dB	0.2	0.5
88. Frequency and time weighting at 1 kHz	dB	0.2	0.5
89. Frequency and time weighting at 1 kHz	dB	0.2	0.5
90. Frequency and time weighting at 1 kHz	dB	0.2	0.5
91. Frequency and time weighting at 1 kHz	dB	0.2	0.5
92. Frequency and time weighting at 1 kHz	dB	0.2	0.5
93. Frequency and time weighting at 1 kHz	dB	0.2	0.5
94. Frequency and time weighting at 1 kHz	dB	0.2	0.5
95. Frequency and time weighting at 1 kHz	dB	0.2	0.5
96. Frequency and time weighting at 1 kHz	dB	0.2	0.5
97. Frequency and time weighting at 1 kHz	dB	0.2	0.5
98. Frequency and time weighting at 1 kHz	dB	0.2	0.5
99. Frequency and time weighting at 1 kHz	dB	0.2	0.5
100. Frequency and time weighting at 1 kHz	dB	0.2	0.5

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7. Level stability on the reference level range

Accepted Value	Decimated Value	Measured Value	Percent Error
0.1	0.1	0.1	0.0%
0.5	0.5	0.5	0.0%
1.0	1.0	1.0	0.0%
2.0	2.0	2.0	0.0%
5.0	5.0	5.0	0.0%
10.0	10.0	10.0	0.0%
20.0	20.0	20.0	0.0%
50.0	50.0	50.0	0.0%
100.0	100.0	100.0	0.0%
200.0	200.0	200.0	0.0%
500.0	500.0	500.0	0.0%
1000.0	1000.0	1000.0	0.0%
2000.0	2000.0	2000.0	0.0%
5000.0	5000.0	5000.0	0.0%
10000.0	10000.0	10000.0	0.0%
20000.0	20000.0	20000.0	0.0%
50000.0	50000.0	50000.0	0.0%
100000.0	100000.0	100000.0	0.0%
200000.0	200000.0	200000.0	0.0%
500000.0	500000.0	500000.0	0.0%
1000000.0	1000000.0	1000000.0	0.0%
2000000.0	2000000.0	2000000.0	0.0%
5000000.0	5000000.0	5000000.0	0.0%
10000000.0	10000000.0	10000000.0	0.0%
20000000.0	20000000.0	20000000.0	0.0%
50000000.0	50000000.0	50000000.0	0.0%
100000000.0	100000000.0	100000000.0	0.0%
200000000.0	200000000.0	200000000.0	0.0%
500000000.0	500000000.0	500000000.0	0.0%
1000000000.0	1000000000.0	1000000000.0	0.0%
2000000000.0	2000000000.0	2000000000.0	0.0%
5000000000.0	5000000000.0	5000000000.0	0.0%
10000000000.0	10000000000.0	10000000000.0	0.0%
20000000000.0	20000000000.0	20000000000.0	0.0%
50000000000.0	50000000000.0	50000000000.0	0.0%
100000000000.0	100000000000.0	100000000000.0	0.0%
200000000000.0	200000000000.0	200000000000.0	0.0%
500000000000.0	500000000000.0	500000000000.0	0.0%
1000000000000.0	1000000000000.0	1000000000000.0	0.0%
2000000000000.0	2000000000000.0	2000000000000.0	0.0%
5000000000000.0	5000000000000.0	5000000000000.0	0.0%
10000000000000.0	10000000000000.0	10000000000000.0	0.0%
20000000000000.0	20000000000000.0	20000000000000.0	0.0%
50000000000000.0	50000000000000.0	50000000000000.0	0.0%
100000000000000.0	100000000000000.0	100000000000000.0	0.0%
200000000000000.0	200000000000000.0	200000000000000.0	0.0%
500000000000000.0	500000000000000.0	500000000000000.0	0.0%
1000000000000000.0	1000000000000000.0	1000000000000000.0	0.0%
2000000000000000.0	2000000000000000.0	2000000000000000.0	0.0%
5000000000000000.0	5000000000000000.0	5000000000000000.0	0.0%
10000000000000000.0	10000000000000000.0	10000000000000000.0	0.0%
20000000000000000.0	20000000000000000.0	20000000000000000.0	0.0%
50000000000000000.0	50000000000000000.0	50000000000000000.0	0.0%
100000000000000000.0	100000000000000000.0	100000000000000000.0	0.0%
200000000000000000.0	200000000000000000.0	200000000000000000.0	0.0%
500000000000000000.0	500000000000000000.0	500000000000000000.0	0.0%
1000000000000000000.0	1000000000000000000.0	1000000000000000000.0	0.0%
2000000000000000000.0	2000000000000000000.0	2000000000000000000.0	0.0%
5000000000000000000.0	5000000000000000000.0	5000000000000000000.0	0.0%
10000000000000000000.0	10000000000000000000.0	10000000000000000000.0	0.0%
20000000000000000000.0	20000000000000000000.0	20000000000000000000.0	0.0%
50000000000000000000.0	50000000000000000000.0	50000000000000000000.0	0.0%
100000000000000000000.0	100000000000000000000.0	100000000000000000000.0	0.0%
200000000000000000000.0	200000000000000000000.0	200000000000000000000.0	0.0%
500000000000000000000.0	500000000000000000000.0	500000000000000000000.0	0.0%
1000000000000000000000.0	1000000000000000000000.0	1000000000000000000000.0	0.0%
2000000000000000000000.0	2000000000000000000000.0	2000000000000000000000.0	0.0%
5000000000000000000000.0	5000000000000000000000.0	5000000000000000000000.0	0.0%
10000000000000000000000.0	10000000000000000000000.0	10000000000000000000000.0	0.0%
20000000000000000000000.0	20000000000000000000000.0	20000000000000000000000.0	0.0%
50000000000000000000000.0	50000000000000000000000.0	50000000000000000000000.0	0.0%
100000000000000000000000.0	100000000000000000000000.0	100000000000000000000000.0	0.0%
200000000000000000000000.0	200000000000000000000000.0	200000000000000000000000.0	0.0%
500000000000000000000000.0	500000000000000000000000.0	500000000000000000000000.0	0.0%
1000000000000000000000000.0	1000000000000000000000000.0	1000000000000000000000000.0	0.0%
2000000000000000000000000.0	2000000000000000000000000.0	2000000000000000000000000.0	0.0%
5000000000000000000000000.0	5000000000000000000000000.0	5000000000000000000000000.0	0.0%
10000000000000000000000000.0	10000000000000000000000000.0	10000000000000000000000000.0	0.0%
20000000000000000000000000.0	20000000000000000000000000.0	20000000000000000000000000.0	0.0%
50000000000000000000000000.0	50000000000000000000000000.0	50000000000000000000000000.0	0.0%
100000000000000000000000000.0	100000000000000000000000000.0	100000000000000000000000000.0	0.0%
200000000000000000000000000.0	200000000000000000000000000.0	200000000000000000000000000.0	0.0%
500000000000000000000000000.0	500000000000000000000000000.0	500000000000000000000000000.0	0.0%
1000000000000000000000000000.0	1000000000000000000000000000.0	1000000000000000000000000000.0	0.0%
2000000000000000000000000000.0	2000000000000000000000000000.0	2000000000000000000000000000.0	0.0%
5000000000000000000000000000.0	5000000000000000000000000000.0	5000000000000000000000000000.0	0.0%
10000000000000000000000000000.0	10000000000000000000000000000.0	10000000000000000000000000000.0	0.0%
20000000000000000000000000000.0	20000000000000000000000000000.0	20000000000000000000000000000.0	0.0%
50000000000000000000000000000.0	50000000000000000000000000000.0	50000000000000000000000000000.0	0.0%
100000000000000000000000000000.0	100000000000000000000000000000.0	100000000000000000000000000000.0	0.0%
200000000000000000000000000000.0	200000000000000000000000000000.0	200000000000000000000000000000.0	0.0%
500000000000000000000000000000.0	500000000000000000000000000000.0	500000000000000000000000000000.0	0.0%
1000000000000000000000000000000.0	1000000000000000000000000000000.0	1000000000000000000000000000000.0	0.0%
2000000000000000000000000000000.0	2000000000000000000000000000000.0	2000000000000000000000000000000.0	0.0%
5000000000000000000000000000000.0	5000000000000000000000000000000.0	5000000000000000000000000000000.0	0.0%
10000000000000000000000000000000.0	10000000000000000000000000000000.0	10000000000000000000000000000000.0	0.0%
20000000000000000000000000000000.0	20000000000000000000000000000000.0	20000000000000000000000000000000.0	0.0%
50000000000000000000000000000000.0	50000000000000000000000000000000.0	50000000000000000000000000000000.0	0.0%
100000000000000000000000000000000.0	100000000000000000000000000000000.0	100000000000000000000000000000000.0	0.0%
200000000000000000000000000000000.0	200000000000000000000000000000000.0	200000000000000000000000000000000.0	0.0%
500000000000000000000000000000000.0	500000000000000000000000000000000.0	500000000000000000000000000000000.0	0.0%
1000000000000000000000000000000000.0	1000000000000000000000000000000000.0	1000000000000000000000000000000000.0	0.0%
2000000000000000000000000000000000.0	2000000000000000000000000000000000.0	2000000000000000000000000000000000.0	0.0%
5000000000000000000000000000000000.0	5000000000000000000000000000000000.0	5000000000000000000000000000000000.0	0.0%
10000000000000000000000000000000000.0	10000000000000000000000000000000000.0	10000000000000000000000000000000000.0	0.0%
20000000000000000000000000000000000.0	20000000000000000000000000000000000.0	20000000000000000000000000000000000.0	0.0%
50000000000000000000000000000000000.0	50000000000000000000000000000000000.0	50000000000000000000000000000000000.0	0.0%
100000000000000000000000000000000000.0	100000000000000000000000000000000000.0	100000000000000000000000000000000000.0	0.0%
200000000000000000000000000000000000.0	200000000000000000000000000000000000.0	200000000000000000000000000000000000.0	0.0%
500000000000000000000000000000000000.0	500000000000000000000000000000000000.0	500000000000000000000000000000000000.0	0.0%
1000000000000000000000000000000000000.0	1000000000000000000000000000000000000.0	1000000000000000000000000000000000000.0	0.0%
2000000000000000000000000000000000000.0	2000000000000000000000000000000000000.0	2000000000000000000000000000000000000.0	0.0%
5000000000000000000000000000000000000.0	5000000000000000000000000000000000000.0	5000000000000000000000000000000000000.0	0.0%
10000000000000000000000000000000000000.0	10000000000000000000000000000000000000.0	10000000000000000000000000000000000000.0	0.0%
20000000000000000000000000000000000000.0	20000000000000000000000000000000000000.0	20000000000000000000000000000000000000.0	0.0%
50000000000000000000000000000000000000.0	50000000000000000000000000000000000000.0	50000000000000000000000000000000000000.0	0.0%
100000000000000000000000000000000000000.0	100000000000000000000000000000000000000.0	100000000000000000000000000000000000000.0	0.0%
200000000000000000000000000000000000000.0	200000000000000000000000000000000000000.0	200000000000000000000000000000000000000.0	0.0%
500000000000000000000000000000000000000.0	500000000000000000000000000000000000000.0	500000000000000000000000000000000000000.0	0.0%
1000000000000000000000000000000000000000.0	1000000000000000000000000000000000000000.0	1000000000000000000000000000000000000000.0	0.0%
2000000000000000000000000000000000000000.0	2000000000000000000000000000000000000000.0	2000000000000000000000000000000000000000.0	0.0%
5000000000000000000000000000000000000000.0	5000000000000000000000000000000000000000.0	5000000000000000000000000000000000000000.0	0.0%
100.0	100.0	100.0	0.0%
200.0	200.0	200.0	0.0%
500.0	500.0	500.0	0.0%
1000.0	1000.0	1000.0	0.0%
2000.0	2000.0	2000.0	0.0%
5000.0	5000.0	5000.0	







## Month of collection:

### E. Absorbance measurements

Reflexion Asymmetry Signal (dB)	Measured Value (dB)	Threshold (dB)	Specimen Loss (dB)
92.5 (97.5%)	91.9	90.0	98.7

### 3. Self-generated noise

100

Minimum Value
1.00
1.00

2.1 The atmosphere of the model hotel sector was captured by physical layout, signs and

Frequency Weighting	Measured value (dB)
A-weighting	11.1
C-weighting	18.1
Total	24.0

### 8. Asymmetrical signal rates of frequency subgroups

100% of the time, the model was able to correctly predict the presence or absence of a specific feature.

Flowing (Hz)	Flow (mL/min)	Flow rate (mL/min)	Flow rate (mL/min)	Flow rate (mL/min)	Flow rate (mL/min)
120	0.1	0.1	0.1	0.1	0.1
100	0.1	0.1	0.1	0.1	0.1
80	0.1	0.1	0.1	0.1	0.1

Y. L. L.

### a. Characterological tests of frequency analysis

Weighting means the response is 100 relative to 1 (this

Frequency (N)	Frequency (%)	Female	Male	Sample	Non-response (N)	Non-response (%)
22	2.2	10	12	32	22	2.2
125	12.5	50	75	125	125	12.5
250	25.0	100	150	250	250	25.0
500	50.0	200	300	500	500	50.0
1000	100.0	400	600	1000	1000	100.0
2000	200.0	800	1200	2000	2000	200.0
4000	400.0	1600	2400	4000	4000	400.0
8000	800.0	3200	4800	8000	8000	800.0

### 8. Frequency and time windows of LMMs

3.1 Frequency analysis of 1000

Frequency/Weighting	Mixedwood Value (dollar)	Deciduous Value (dollar)	Assignment
A = weight	90.0	9.0	
C = weight	90.0	9.0	0.02
Total	90.0	9.0	0.02

## 6.2 hour workshop in 1 table

Frequency Mapping	Measured Value (dB)	Desired Value (dB)	Significance
Fast	84.0	8.0	-
Slow	84.0	0.0	n.d.
Long	84.0	0.0	n.d.

## a. Long-term stability

Frequency Weighting	ME Ad Display at initial (1.00 s)	ME Ad Display at final (1.00 s)	Desired Value (1.00 s)	Acceptance (1.00 s)
B-weighting	0.00	0.00	0.00	0.00

7. *Chlor.*

W. David Burnside for facilitating the local cancer control

Range	Activated Sludge System ( $\pm 0.03$ )	Microbial Sludge System ( $\pm 0.03$ )	Decanted Sludge System ( $\pm 0.03$ )	Acceptance Criteria ( $\pm 0.03$ )
Value	0.01	0.02	0.0	0.02

### 9. Total board response

Time Step	Time Step Integration	Time Step (h)	Cycle	Accepted Value (mm)	Discarded Value (mm)	Accepted Residuals
1	1	1	1	1.00E-1	0.00E+0	1.0E-1
2	2	2	2	1.00E-1	0.00E+0	2.0E-1
3	3	3	3	1.00E-1	0.00E+0	3.0E-1
4	4	4	4	1.00E-1	0.00E+0	4.0E-1
5	5	5	5	1.00E-1	0.00E+0	5.0E-1
6	6	6	6	1.00E-1	0.00E+0	6.0E-1
7	7	7	7	1.00E-1	0.00E+0	7.0E-1
8	8	8	8	1.00E-1	0.00E+0	8.0E-1
9	9	9	9	1.00E-1	0.00E+0	9.0E-1
10	10	10	10	1.00E-1	0.00E+0	1.0E+0
11	11	11	11	1.00E-1	0.00E+0	1.1E+0
12	12	12	12	1.00E-1	0.00E+0	1.2E+0
13	13	13	13	1.00E-1	0.00E+0	1.3E+0
14	14	14	14	1.00E-1	0.00E+0	1.4E+0
15	15	15	15	1.00E-1	0.00E+0	1.5E+0
16	16	16	16	1.00E-1	0.00E+0	1.6E+0
17	17	17	17	1.00E-1	0.00E+0	1.7E+0
18	18	18	18	1.00E-1	0.00E+0	1.8E+0
19	19	19	19	1.00E-1	0.00E+0	1.9E+0
20	20	20	20	1.00E-1	0.00E+0	2.0E+0
21	21	21	21	1.00E-1	0.00E+0	2.1E+0
22	22	22	22	1.00E-1	0.00E+0	2.2E+0
23	23	23	23	1.00E-1	0.00E+0	2.3E+0
24	24	24	24	1.00E-1	0.00E+0	2.4E+0
25	25	25	25	1.00E-1	0.00E+0	2.5E+0
26	26	26	26	1.00E-1	0.00E+0	2.6E+0
27	27	27	27	1.00E-1	0.00E+0	2.7E+0
28	28	28	28	1.00E-1	0.00E+0	2.8E+0
29	29	29	29	1.00E-1	0.00E+0	2.9E+0
30	30	30	30	1.00E-1	0.00E+0	3.0E+0
31	31	31	31	1.00E-1	0.00E+0	3.1E+0
32	32	32	32	1.00E-1	0.00E+0	3.2E+0
33	33	33	33	1.00E-1	0.00E+0	3.3E+0
34	34	34	34	1.00E-1	0.00E+0	3.4E+0
35	35	35	35	1.00E-1	0.00E+0	3.5E+0
36	36	36	36	1.00E-1	0.00E+0	3.6E+0
37	37	37	37	1.00E-1	0.00E+0	3.7E+0
38	38	38	38	1.00E-1	0.00E+0	3.8E+0
39	39	39	39	1.00E-1	0.00E+0	3.9E+0
40	40	40	40	1.00E-1	0.00E+0	4.0E+0
41	41	41	41	1.00E-1	0.00E+0	4.1E+0
42	42	42	42	1.00E-1	0.00E+0	4.2E+0
43	43	43	43	1.00E-1	0.00E+0	4.3E+0
44	44	44	44	1.00E-1	0.00E+0	4.4E+0
45	45	45	45	1.00E-1	0.00E+0	4.5E+0
46	46	46	46	1.00E-1	0.00E+0	4.6E+0
47	47	47	47	1.00E-1	0.00E+0	4.7E+0
48	48	48	48	1.00E-1	0.00E+0	4.8E+0
49	49	49	49	1.00E-1	0.00E+0	4.9E+0
50	50	50	50	1.00E-1	0.00E+0	5.0E+0
51	51	51	51	1.00E-1	0.00E+0	5.1E+0
52	52	52	52	1.00E-1	0.00E+0	5.2E+0
53	53	53	53	1.00E-1	0.00E+0	5.3E+0
54	54	54	54	1.00E-1	0.00E+0	5.4E+0
55	55	55	55	1.00E-1	0.00E+0	5.5E+0
56	56	56	56	1.00E-1	0.00E+0	5.6E+0
57	57	57	57	1.00E-1	0.00E+0	5.7E+0
58	58	58	58	1.00E-1	0.00E+0	5.8E+0
59	59	59	59	1.00E-1	0.00E+0	5.9E+0
60	60	60	60	1.00E-1	0.00E+0	6.0E+0
61	61	61	61	1.00E-1	0.00E+0	6.1E+0
62	62	62	62	1.00E-1	0.00E+0	6.2E+0
63	63	63	63	1.00E-1	0.00E+0	6.3E+0
64	64	64	64	1.00E-1	0.00E+0	6.4E+0
65	65	65	65	1.00E-1	0.00E+0	6.5E+0
66	66	66	66	1.00E-1	0.00E+0	6.6E+0
67	67	67	67	1.00E-1	0.00E+0	6.7E+0
68	68	68	68	1.00E-1	0.00E+0	6.8E+0
69	69	69	69	1.00E-1	0.00E+0	6.9E+0
70	70	70	70	1.00E-1	0.00E+0	7.0E+0
71	71	71	71	1.00E-1	0.00E+0	7.1E+0
72	72	72	72	1.00E-1	0.00E+0	7.2E+0
73	73	73	73	1.00E-1	0.00E+0	7.3E+0
74	74	74	74	1.00E-1	0.00E+0	7.4E+0
75	75	75	75	1.00E-1	0.00E+0	7.5E+0
76	76	76	76	1.00E-1	0.00E+0	7.6E+0
77	77	77	77	1.00E-1	0.00E+0	7.7E+0
78	78	78	78	1.00E-1	0.00E+0	7.8E+0
79	79	79	79	1.00E-1	0.00E+0	7.9E+0
80	80	80	80	1.00E-1	0.00E+0	8.0E+0
81	81	81	81	1.00E-1	0.00E+0	8.1E+0
82	82	82	82	1.00E-1	0.00E+0	8.2E+0
83	83	83	83	1.00E-1	0.00E+0	8.3E+0
84	84	84	84	1.00E-1	0.00E+0	8.4E+0
85	85	85	85	1.00E-1	0.00E+0	8.5E+0
86	86	86	86	1.00E-1	0.00E+0	8.6E+0
87	87	87	87	1.00E-1	0.00E+0	8.7E+0
88	88	88	88	1.00E-1	0.00E+0	8.8E+0
89	89	89	89	1.00E-1	0.00E+0	8.9E+0
90	90	90	90	1.00E-1	0.00E+0	9.0E+0
91	91	91	91	1.00E-1	0.00E+0	9.1E+0
92	92	92	92	1.00E-1	0.00E+0	9.2E+0
93	93	93	93	1.00E-1	0.00E+0	9.3E+0
94	94	94	94	1.00E-1	0.00E+0	9.4E+0
95	95	95	95	1.00E-1	0.00E+0	9.5E+0
96	96	96	96	1.00E-1	0.00E+0	9.6E+0
97	97	97	97	1.00E-1	0.00E+0	9.7E+0
98	98	98	98	1.00E-1	0.00E+0	9.8E+0
99	99	99	99	1.00E-1	0.00E+0	9.9E+0
100	100	100	100	1.00E-1	0.00E+0	1.0E+1

## 488 Books of interest

Number of cycles in test against C <sub>1</sub> maximum	Asynchronous		Decomposed		Asynchronous
	Value (cycles)	Value (μs)	Value (cycles)	Value (μs)	
One	1310	136.4	508	53.8	53.8

7. Rehe.

T. K. and himself on the reference level range

Assigned	Measured		Desired		Assessment
	Value	( $\Delta$ )	Value	( $\Delta$ )	
1	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00
32	0.00	0.00	0.00	0.00	0.00
33	0.00	0.00	0.00	0.00	0.00
34	0.00	0.00	0.00	0.00	0.00
35	0.00	0.00	0.00	0.00	0.00
36	0.00	0.00	0.00	0.00	0.00
37	0.00	0.00	0.00	0.00	0.00
38	0.00	0.00	0.00	0.00	0.00
39	0.00	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00
41	0.00	0.00	0.00	0.00	0.00
42	0.00	0.00	0.00	0.00	0.00
43	0.00	0.00	0.00	0.00	0.00
44	0.00	0.00	0.00	0.00	0.00
45	0.00	0.00	0.00	0.00	0.00
46	0.00	0.00	0.00	0.00	0.00
47	0.00	0.00	0.00	0.00	0.00
48	0.00	0.00	0.00	0.00	0.00
49	0.00	0.00	0.00	0.00	0.00
50	0.00	0.00	0.00	0.00	0.00
51	0.00	0.00	0.00	0.00	0.00
52	0.00	0.00	0.00	0.00	0.00
53	0.00	0.00	0.00	0.00	0.00
54	0.00	0.00	0.00	0.00	0.00
55	0.00	0.00	0.00	0.00	0.00
56	0.00	0.00	0.00	0.00	0.00
57	0.00	0.00	0.00	0.00	0.00
58	0.00	0.00	0.00	0.00	0.00
59	0.00	0.00	0.00	0.00	0.00
60	0.00	0.00	0.00	0.00	0.00
61	0.00	0.00	0.00	0.00	0.00
62	0.00	0.00	0.00	0.00	0.00
63	0.00	0.00	0.00	0.00	0.00
64	0.00	0.00	0.00	0.00	0.00
65	0.00	0.00	0.00	0.00	0.00
66	0.00	0.00	0.00	0.00	0.00
67	0.00	0.00	0.00	0.00	0.00
68	0.00	0.00	0.00	0.00	0.00
69	0.00	0.00	0.00	0.00	0.00

T. C. C.

## Calibration Certificate

Equipment :	WORKING ALZHEIMER	GOOD			
Manufacturer :	20100				
Model :	36734				
Serial No.:	14071220				
ID No.:	Indo_Panda				
Condition As Found :					
Customer :	LABORATORY GROUP (THAI) ARSIPOL, LTD. 304 PHATHANOMAN RD. PHATHANOMAN BULID, BANGKOK, PHATHANOMAN KERT MANGLOK, BANGKOK, THAILAND.				
Location :					
Applied Temperature :	21.0 ± 0.5 °C				
Pressure :	1110 ± 0.5 kPa				
Relative Humidity :	5.96 ± 0.09 %				
Revised Date :	09 JANUARY 2022				
Calibration Date :	14 JANUARY 2022				
Date of Issue :	17 JANUARY 2022				

Calibration Procedures : CP-NC-03

Calibration Method :

This equipment was calibrated by based on IEC 61010-2:2010 standard.  
The stated pressure level, frequency and load deviation of the tested equipment are confirmed using the following methods:

Condition of this result of calibration :

Instrument	Model	Serial No.	Cert. No.	Due Date
Residual Generator	3311B	MT120742	37-001-21	10-06-22
Liquid Multimeter	3441A	MT120744	331-001-04-0204	10-06-22
Digital Multimeter	3441A	MT120746	331-001-04-01-0204	10-06-22
Digital Multimeter	3441A	MT120748	331-001-04-01-0204	10-06-22
Programmable Resistance	MAT-4000	42100114	330-077140	10-06-22
Programmable Resistance	MAT-4000	42100114	330-077140	10-06-22
Measuring Amplifier	96142B-A	34504401	A-6-0001-21	10-06-22
Audio Analyzer	AVR-2500A	57440409	37-001-21	10-06-22

2. This result of calibration was based on the use of the following equipment for this calibration (see table).

3. This certificate is provided by the International System of Unit maintained at:

3.1 National Institute of Standards and Technology (NIST).

3.2 Thailand Institute of Standards and Technology (TIS).

GP-1013-04-04-0204

T. R. R.

Calibration Procedures : CP-NC-03

Calibration Method :

This equipment was calibrated by based on IEC 61010-2:2010 standard for used load level (1.0A).  
The stated load level is confirmed and Electrical signal level of frequency weighting with calibration deviation and tolerance.  
For each result of each item were taken by observation of each instrument display and data with 10 Hz display.

Condition of this result of calibration :

Instrument	Model	Serial No.	Cert. No.	Due Date
Residual Generator	3311B	MT120742	37-001-21	10-06-22
Liquid Multimeter	3441A	MT120744	331-001-04-0204	10-06-22
Digital Multimeter	3441A	MT120746	331-001-04-01-0204	10-06-22
Digital Multimeter	3441A	MT120748	331-001-04-01-0204	10-06-22
Programmable Resistance	MAT-4000	42100114	330-077140	10-06-22
Programmable Resistance	MAT-4000	42100114	330-077140	10-06-22
Measuring Amplifier	96142B-A	34504401	A-6-0001-21	10-06-22

2. This result of calibration was based on the use of the following equipment for this calibration (see table).

3. This certificate is provided by the International System of Unit maintained at:

3.1 National Institute of Standards and Technology (NIST).

3.2 Thailand Institute of Standards and Technology (TIS).

GP-1013-04-04-0204

T. R. R.

Result of calibration :

1. Sound pressure level

Specified sound pressure level (dB)	Measured value (dB)	Deviation value (dB)	Tolerance (dB)
94	94.08	0.08	0.1

2. Frequency

Specified Frequency (Hz)	Measured value (Hz)	Deviation value (Hz)	Tolerance (Hz)
1000	1001.3	0.3	0.1

3. Tonal distortion

Measured value (%)	Uncertainty (%)	Tolerance limit (%)
1.28	0.08	0.8

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor k = 2,  
at any value following calibration providing a level of confidence of approximately 95 %.

End of Calibration Certificate

GP-1013-04-04-0204

T. R. R.

Summary of Measurement Result :

Parameter	Pass	Fail	Uncertainty (dB)	Maximum permitted uncertainty of measurement (dB)
1. Absolute sensitivity	✓	✓	0.2	0.5
2. Self generated noise	✓	✓	0.2	0.5
3. Acoustic signal level of frequency weighting	✓	✓	0.2	0.5
4. Frequency and time weighting	✓	✓	0.2	0.5
5. Frequency and time weighting	✓	✓	0.2	0.5
6. Load level	✓	✓	0.2	0.5
7. Load level	✓	✓	0.2	0.5
8. Load level	✓	✓	0.2	0.5
9. Load level	✓	✓	0.2	0.5
10. Load level	✓	✓	0.2	0.5
11. Load level	✓	✓	0.2	0.5
12. Load level	✓	✓	0.2	0.5

GP-1013-04-04-0204

T. R. R.

Calibration Certificate

Equipment :  
Manufacturer :  
Model :  
Serial No. :  
ID No. :

Condition As Found :  
Customer :  
Location :  
Address :  
City :  
Country :  
Date of Issue :  
Date of Validity :

Calibrated by :  
Approved By :  
Signature :  
Date :  
Time :  
Place :

Calibration Procedures

Approved By :  
Signature :  
Date :  
Time :  
Place :

This certificate is based on the requirements of ISO/IEC 17025 standard. Any use not represented  
other than to follow, except with the prior written approval of the head of Calibration Laboratory.

GP-1013-04-04-0204

T. R. R.

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Tolerance (dB)
93.9 (dB)	93.9	0.0	0.5

2. Self generated noise

2.1 Normal use

Measured Value (dB)
93.9

2.2 The calibration of the tested level of noise was approved by standard against legal device.

Frequency (Hz)	Measured value (dB)
125	11.0
250	11.0
500	11.0
1000	11.0
2000	11.0
4000	11.0
8000	11.0
16000	11.0

3. Acoustic signal level of frequency weighting

3.1 Normal use

Frequency (Hz)	Measured value (dB)	Deviation (dB)	Tolerance (dB)
125	11.0	0.0	0.5
250	11.0	0.0	0.5
500	11.0	0.0	0.5
1000	11.0	0.0	0.5
2000	11.0	0.0	0.5
4000	11.0	0.0	0.5
8000	11.0	0.0	0.5
16000	11.0	0.0	0.5

GP-1013-04-04-0204

T. R. R.





Continuation of Calibration Certificate

Summary of Measurement Results:

Parameter	Find	Uncertainty (k=1)	Maximum permitted uncertainty of measurement (k=1)
1. Absolute sensitivity	✓	± 0.2	N/A
2. Self-generated noise	✓	± 0.2	N/A
3. Assembled signal rate of frequency weighting	✓	± 0.2	N/A
4. Displaced signal rate of frequency weighting	✓	± 0.2	N/A
5. Frequency and time weighting at 1 kHz	✓	± 0.2	N/A
6. Frequency and time weighting at 1 kHz	✓	± 0.2	N/A
7. Long-term stability	✓	± 0.2	N/A
8. Level stability at the reference level range	✓	± 0.2	N/A
9. Level stability at the reference level range	✓	± 0.2	N/A
10. Peak C-curve level	✓	± 0.2	N/A
11. Overload indication	✓	± 0.2	N/A
12. High level stability	✓	± 0.2	N/A

QP-7512-04-02004

T. Bhat.

Continuation of Calibration Certificate

5. Level stability at the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit
137.0	137.0	0.0	± 0.2
138.0	138.0	0.0	± 0.2
139.0	139.0	0.0	± 0.2
140.0	140.0	0.0	± 0.2
141.0	141.0	0.0	± 0.2
142.0	142.0	0.0	± 0.2
143.0	143.0	0.0	± 0.2
144.0	144.0	0.0	± 0.2
145.0	145.0	0.0	± 0.2
146.0	146.0	0.0	± 0.2
147.0	147.0	0.0	± 0.2
148.0	148.0	0.0	± 0.2
149.0	149.0	0.0	± 0.2
150.0	150.0	0.0	± 0.2
151.0	151.0	0.0	± 0.2
152.0	152.0	0.0	± 0.2
153.0	153.0	0.0	± 0.2
154.0	154.0	0.0	± 0.2
155.0	155.0	0.0	± 0.2
156.0	156.0	0.0	± 0.2
157.0	157.0	0.0	± 0.2
158.0	158.0	0.0	± 0.2
159.0	159.0	0.0	± 0.2
160.0	160.0	0.0	± 0.2

QP-7512-04-02004

T. Bhat.

Continuation of Calibration Certificate

Results of calibration:

1. Absolute sensitivity

Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit
137.0	137.0	0.0	± 0.2

2. Self-generated noise

Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit
137.0	137.0	0.0	± 0.2

3. Assembled signal rate of frequency weighting

Frequency (Hz)	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit
125	137.0	137.0	0.0	± 0.2
250	137.0	137.0	0.0	± 0.2
500	137.0	137.0	0.0	± 0.2
1000	137.0	137.0	0.0	± 0.2
2000	137.0	137.0	0.0	± 0.2
4000	137.0	137.0	0.0	± 0.2
8000	137.0	137.0	0.0	± 0.2

4. Displaced signal rate of frequency weighting

Frequency (Hz)	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit
125	137.0	137.0	0.0	± 0.2
250	137.0	137.0	0.0	± 0.2
500	137.0	137.0	0.0	± 0.2
1000	137.0	137.0	0.0	± 0.2
2000	137.0	137.0	0.0	± 0.2
4000	137.0	137.0	0.0	± 0.2
8000	137.0	137.0	0.0	± 0.2

QP-7512-04-02004

T. Bhat.

Continuation of Calibration Certificate

6. Level stability including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit
Auto	137.0	137.0	0.0	± 0.2

7. Time level response

Time	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit
100	137.0	137.0	0.0	± 0.2
200	137.0	137.0	0.0	± 0.2
300	137.0	137.0	0.0	± 0.2
400	137.0	137.0	0.0	± 0.2
500	137.0	137.0	0.0	± 0.2
600	137.0	137.0	0.0	± 0.2
700	137.0	137.0	0.0	± 0.2
800	137.0	137.0	0.0	± 0.2
900	137.0	137.0	0.0	± 0.2
1000	137.0	137.0	0.0	± 0.2
1100	137.0	137.0	0.0	± 0.2
1200	137.0	137.0	0.0	± 0.2
1300	137.0	137.0	0.0	± 0.2
1400	137.0	137.0	0.0	± 0.2
1500	137.0	137.0	0.0	± 0.2
1600	137.0	137.0	0.0	± 0.2
1700	137.0	137.0	0.0	± 0.2
1800	137.0	137.0	0.0	± 0.2
1900	137.0	137.0	0.0	± 0.2
2000	137.0	137.0	0.0	± 0.2

8. Peak C-curve level

Number of cycles	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit
1	137.0	137.0	0.0	± 0.2
2	137.0	137.0	0.0	± 0.2
3	137.0	137.0	0.0	± 0.2
4	137.0	137.0	0.0	± 0.2
5	137.0	137.0	0.0	± 0.2
6	137.0	137.0	0.0	± 0.2
7	137.0	137.0	0.0	± 0.2
8	137.0	137.0	0.0	± 0.2
9	137.0	137.0	0.0	± 0.2
10	137.0	137.0	0.0	± 0.2
11	137.0	137.0	0.0	± 0.2
12	137.0	137.0	0.0	± 0.2
13	137.0	137.0	0.0	± 0.2
14	137.0	137.0	0.0	± 0.2
15	137.0	137.0	0.0	± 0.2
16	137.0	137.0	0.0	± 0.2
17	137.0	137.0	0.0	± 0.2
18	137.0	137.0	0.0	± 0.2
19	137.0	137.0	0.0	± 0.2
20	137.0	137.0	0.0	± 0.2

QP-7512-04-02004

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Continuation of Calibration Certificate

9. Displaced signal rate of frequency weighting

Weighting method response with reference to 1 kHz

Frequency (Hz)	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit
125	137.0	137.0	0.0	± 0.2
250	137.0	137.0	0.0	± 0.2
500	137.0	137.0	0.0	± 0.2
1000	137.0	137.0	0.0	± 0.2
2000	137.0	137.0	0.0	± 0.2
4000	137.0	137.0	0.0	± 0.2
8000	137.0	137.0	0.0	± 0.2

10. Frequency and time weighting at 1 kHz

3.1 Frequency weighting at 1 kHz

Frequency (Hz)	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit
125	137.0	137.0	0.0	± 0.2
250	137.0	137.0	0.0	± 0.2
500	137.0	137.0	0.0	± 0.2
1000	137.0	137.0	0.0	± 0.2
2000	137.0	137.0	0.0	± 0.2
4000	137.0	137.0	0.0	± 0.2
8000	137.0	137.0	0.0	± 0.2

3.2 Time weighting at 1 kHz

Frequency (Hz)	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit
125	137.0	137.0	0.0	± 0.2
250	137.0	137.0	0.0	± 0.2
500	137.0	137.0	0.0	± 0.2
1000	137.0	137.0	0.0	± 0.2
2000	137.0	137.0	0.0	± 0.2
4000	137.0	137.0	0.0	± 0.2
8000	137.0	137.0	0.0	± 0.2

11. Long-term stability

Frequency (Hz)	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit
125	137.0	137.0	0.0	± 0.2
250	137.0	137.0	0.0	± 0.2
500	137.0	137.0	0.0	± 0.2
1000	137.0	137.0	0.0	± 0.2
2000	137.0	137.0	0.0	± 0.2
4000	137.0	137.0	0.0	± 0.2
8000	137.0	137.0	0.0	± 0.2

QP-7512-04-02004

T. Bhat.

Continuation of Calibration Certificate

12. Overload indication

Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit
137.0	137.0	0.0	± 0.2

13. High level stability

Frequency (Hz)	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit
125	137.0	137.0	0.0	± 0.2
250	137.0	137.0	0.0	± 0.2
500	137.0	137.0	0.0	± 0.2
1000	137.0	137.0	0.0	± 0.2
2000	137.0	137.0	0.0	± 0.2
4000	137.0	137.0	0.0	± 0.2
8000	137.0	137.0	0.0	± 0.2

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor k = 2, in any value following calibration providing a level of confidence of approximately 95 %

End of Calibration Certificate

QP-7512-04-02004

T. Bhat.











## Calibration Results : Without Adjustment

Repeatability	
The repeatability of the results of a weighing measurement is determined by the difference between the results of the same weighing measurement under the same conditions. The results of the same weighing measurement are determined by the difference between the results of the same weighing measurement under the same conditions. The results of the same weighing measurement are determined by the difference between the results of the same weighing measurement under the same conditions.	
Normal Value (Low Load)	20.0000
Tolerance	0.0001
Normal Value (High Load)	200.0000
Tolerance	0.0001
Standard Deviation	0.00005

ISO 9001:2015, ISO 17025:2017

## Certificate of Calibration

Equipment	1 Liquid Bath (Water)
Manufacturer	1 MEMMERT
Model	2 WNR29
Serial No.	1 6110135
Customer Code	1 BKK_250148
ID No.	1 T648544
Customer	1 ALS Laboratory Group (Thailand) Co., Ltd. 104 Phatthanakan 46, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10150
Customer Location	1 ORGANIC PREPARATION LAB
Date of Receipt	1 3 September 2020
Calibrated By	1 Wacharaporn Saengseng (Technician)
Approved By	1 Banchal Sutiyong (Site Calibration Manager)
Date of Issue	1 8 March 2021

The uncertainties are for a confidence probability of approximately 95%.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Institute, which has assessed the measurement capability of the laboratory and its traceability to international standards and to the units of measurement defined at the corresponding national standard laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Metrological Center.

Page 1 of 2

## Certificate of Calibration

Equipment	1 Digital Scale
Manufacturer	1 Sartorius
Model	1 MS2054
Type of Balance	1 Top Pan
Customer	1 ALS Laboratory Group (Thailand) Co., Ltd. 104 Phatthanakan 46, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10150
Environment Condition	1 Temperature : 23.5 °C 1 Humidity : 45 % RH
Calibration Point	1 20.0000 g 1 200.0000 g
The Method used	1 Weighing by Difference
Calibration By	1 Banchal Sutiyong

ISO 9001:2015, ISO 17025:2017

## Calibration Report

Equipment	1 Liquid Bath (Water)
Date of Calibration	1 3 September 2020
Environment	1 Temperature : 23.5 ± 0.5 °C 1 Humidity : 45 ± 5 % RH
Calibration Point	1 20.0000 g 1 200.0000 g
The Method used	1 Weighing by Difference
Calibration By	1 Banchal Sutiyong

The uncertainties are for a confidence probability of approximately 95%.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Institute, which has assessed the measurement capability of the laboratory and its traceability to international standards and to the units of measurement defined at the corresponding national standard laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Metrological Center.

Page 1 of 2

## Certificate of Calibration

Equipment	1 Digital Scale
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Environment Condition	1 Temperature : 23.5 °C 1 Humidity : 45 % RH
Calibration Point	1 20.0000 g 1 200.0000 g
The Method used	1 Weighing by Difference
Calibration By	1 Banchal Sutiyong

ISO 9001:2015, ISO 17025:2017

## Calibration Report

Equipment	1 Liquid Bath (Water)
Date of Calibration	1 3 September 2020
Environment	1 Temperature : 23.5 ± 0.5 °C 1 Humidity : 45 ± 5 % RH
Calibration Point	1 20.0000 g 1 200.0000 g
The Method used	1 Weighing by Difference
Calibration By	1 Banchal Sutiyong

The uncertainties are for a confidence probability of approximately 95%.

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**SCG Metrological Center**  
SCI ECO Services Company Limited  
332 Moo 3, 7 Bangpa-A Road, Bangpa-A Subdistrict, Bangpa-A District, Bangkok 10110, Thailand  
Tel : +66 2 587 5100 Fax : +66 2 587 5109  
Website : www.sceco.co.th E-Mail : calibrate@scg.co.th

**Certificate of Calibration**  
Page 1 of 2

**Equipment :** DDO Meter with Sensor  
**Manufacturer :** YIP  
**Model :** 5000-250V  
**Serial No. :** 500011147  
**ID No. :** 500011147

**Submitted By :** ALS Laboratory Group (Thailand) Co., Ltd.  
104 Phatthanakan Rd., Phatthanakan Rd., Khwaeng Phatthanakan,  
Khet Suan Laeng, Bangkok 10250

**Location :** 104 Phatthanakan Rd., Phatthanakan Rd., Khwaeng Phatthanakan,  
Khet Suan Laeng, Bangkok 10250

**Received Order :** 24 December 2020  
**Calibrated Date :** 4 January 2021  
**Ambient Temperature :** (20 ± 0.5) °C  
**Relative Humidity :** (50 ± 3) %  
**AC Line Voltage :** (220 ± 2) V

**Calculated By :** [Signature]  
**Approved By :** [Signature]  
**Issue Date :** 7 January 2021

**Uncertainties are for a confidence probability of approximately 95%.**

**SCG Metrological Center**  
SCI ECO Services Company Limited  
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**Certificate of Calibration**  
Page 1 of 2

**Equipment :** DDO Meter with Sensor  
**Manufacturer :** YIP  
**Model :** 5000-250V  
**Serial No. :** 500011147  
**ID No. :** 500011147

**Submitted By :** ALS Laboratory Group (Thailand) Co., Ltd.  
104 Phatthanakan Rd., Phatthanakan Rd., Khwaeng Phatthanakan,  
Khet Suan Laeng, Bangkok 10250

**Location :** 104 Phatthanakan Rd., Phatthanakan Rd., Khwaeng Phatthanakan,  
Khet Suan Laeng, Bangkok 10250

**Received Order :** 24 December 2020  
**Calibrated Date :** 4 January 2021  
**Ambient Temperature :** (20 ± 0.5) °C  
**Relative Humidity :** (50 ± 3) %  
**AC Line Voltage :** (220 ± 2) V

**Calculated By :** [Signature]  
**Approved By :** [Signature]  
**Issue Date :** 7 January 2021

**Uncertainties are for a confidence probability of approximately 95%.**

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**Certificate of Calibration**  
Page 1 of 3

**Equipment :** Chamber (Incubator)  
**Manufacturer :** SHEL LAB  
**Model :** 2020-2E  
**Serial No. :** 802899  
**Customer Code :** BKK\_F08085  
**ID No. :** T149540  
**Customer :** ALS Laboratory Group (Thailand) Co., Ltd.  
104 Phatthanakan Rd., Phatthanakan Rd., Khwaeng Phatthanakan,  
Khet Suan Laeng, Bangkok 10250

**Customer Location :** 104 Phatthanakan Rd., Phatthanakan Rd., Khwaeng Phatthanakan,  
Khet Suan Laeng, Bangkok 10250

**Date of Receipt :** 1 October 2021

**Calibrated By :** Sujjar Nukakred (Site Calibration Manager)

**Approved By :** [Signature]  
**Date of Issue :** 8 October 2021

**Uncertainties are for a confidence probability of approximately 95%.**

**SCG Metrological Center**  
SCI ECO Services Company Limited  
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**Certificate of Calibration**  
Page 2 of 3

**Equipment :** Chamber (Incubator)  
**Manufacturer :** SHEL LAB  
**Model :** 2020-2E  
**Serial No. :** 802899  
**Customer Code :** BKK\_F08085  
**ID No. :** T149540  
**Customer :** ALS Laboratory Group (Thailand) Co., Ltd.  
104 Phatthanakan Rd., Phatthanakan Rd., Khwaeng Phatthanakan,  
Khet Suan Laeng, Bangkok 10250

**Customer Location :** 104 Phatthanakan Rd., Phatthanakan Rd., Khwaeng Phatthanakan,  
Khet Suan Laeng, Bangkok 10250

**Date of Receipt :** 1 October 2021

**Calibrated By :** Sujjar Nukakred (Site Calibration Manager)

**Approved By :** [Signature]  
**Date of Issue :** 8 October 2021

**Uncertainties are for a confidence probability of approximately 95%.**

**SCG Metrological Center**  
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**Certificate of Calibration**  
Page 3 of 3

**Equipment :** Chamber (Incubator)  
**Manufacturer :** SHEL LAB  
**Model :** 2020-2E  
**Serial No. :** 802899  
**Customer Code :** BKK\_F08085  
**ID No. :** T149540  
**Customer :** ALS Laboratory Group (Thailand) Co., Ltd.  
104 Phatthanakan Rd., Phatthanakan Rd., Khwaeng Phatthanakan,  
Khet Suan Laeng, Bangkok 10250

**Customer Location :** 104 Phatthanakan Rd., Phatthanakan Rd., Khwaeng Phatthanakan,  
Khet Suan Laeng, Bangkok 10250

**Date of Receipt :** 1 October 2021

**Calibrated By :** Sujjar Nukakred (Site Calibration Manager)

**Approved By :** [Signature]  
**Date of Issue :** 8 October 2021

**Uncertainties are for a confidence probability of approximately 95%.**

**SCG Metrological Center**  
SCI ECO Services Company Limited  
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Website : www.sceco.co.th E-Mail : calibrate@scg.co.th

**Certificate of Calibration**  
Page 1 of 5

**Equipment :** HOT BLOCK  
**Manufacturer :** Environmental Express  
**Model :** E300 240  
**Serial No. :** 2017CDDW116  
**Customer Code :** BKK\_EN0222  
**ID No. :** T6769A4  
**Customer :** ALS Laboratory Group (Thailand) Co., Ltd.  
104 Phatthanakan Rd., Phatthanakan Rd., Khwaeng Phatthanakan,  
Khet Suan Laeng, Bangkok 10250

**Customer Location :** 104 Phatthanakan Rd., Phatthanakan Rd., Khwaeng Phatthanakan,  
Khet Suan Laeng, Bangkok 10250

**Date of Receipt :** 1 April 2021

**Calibrated By :** Atiphong Rongrat (Technician)

**Approved By :** [Signature]  
**Date of Issue :** 22 April 2021

**Uncertainties are for a confidence probability of approximately 95%.**

**SCG Metrological Center**  
SCI ECO Services Company Limited  
332 Moo 3, 7 Bangpa-A Road, Bangpa-A Subdistrict, Bangpa-A District, Bangkok 10110, Thailand  
Tel : +66 2 587 5100 Fax : +66 2 587 5109  
Website : www.sceco.co.th E-Mail : calibrate@scg.co.th









## ภาคผนวก จ

สำเนาหนังสืออนุญาตขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

ที่ อก ๐๓๑๐(๑)/ ๑๐๖๙



กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ เขตราชเทวี  
กรุงเทพมหานคร ๑๐๕๐๐

๒๘ มกราคม ๒๕๖๕

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลборาทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๓๐ กรกฎาคม ๒๕๖๓

- สิ่งที่ส่งมาด้วย ๑. รายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น  
๒. รายชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๕ แผ่น  
๓. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๑ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลборาทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุ  
หนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔  
ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร  
ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลборาทอรี กรุ๊ป (ประเทศไทย)  
จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

- ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย ตามสิ่งที่ส่งมาด้วย ๑  
ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๖๒ ราย ตามสิ่งที่ส่งมาด้วย ๒  
ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย จำนวน ๕๙ รายการ น้ำใต้ดิน  
จำนวน ๑๒๖ รายการ อากาศเสีย ๑๖ รายการ สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน ๓๕ รายการ และดิน  
จำนวน ๑๒๕ รายการ รวมทั้งสิ้นจำนวน ๓๖๑ รายการ ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒ กันยายน ๒๕๖๖ หากประสงค์จะต่ออายุหนังสือ  
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอ  
ต่อกรมโรงงานอุตสาหกรรม ภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์  
เอกชน ซึ่งคำขอต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายศิริะ จันทรเจต)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๒๐๒ ๔๑๔๖ ๐ ๒๒๐๒ ๔๐๐๒

โทรสาร ๐ ๒๓๕๔ ๓๒๐๘ ๐ ๒๓๕๔ ๓๔๑๕

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

เลขทะเบียน ว-๒๐๔

ที่ อก ๐๓๑๐(๑)/

ลงวันที่ ๒๘ มกราคม ๒๕๖๕

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย

๑) นางสาวยุพาพร จันทร์เปล่ง

ทะเบียนเลขที่ ว-๒๐๔-ค-๔๗๐๐

๒) นางสาวชัชณีย์ โกมารกุล ณ นคร

ทะเบียนเลขที่ ว-๒๐๔-ค-๔๗๐๑

๓) นายศรายุทธ จิตรานนท์

ทะเบียนเลขที่ ว-๒๐๔-ค-๔๗๐๒

๔) นางสาวกนกกร เอนก

ทะเบียนเลขที่ ว-๒๐๔-ค-๖๑๑๑

๕) นายสุริยา สอนแก้ว

ทะเบียนเลขที่ ว-๒๐๔-ค-๖๑๑๒

๖) นายวิชาญ ชูณหะวัณ

ทะเบียนเลขที่ ว-๒๐๔-ค-๖๑๑๓



(นายศิริระ จันทร์เจิด)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

เลขทะเบียน ว-๒๐๔

ที่ อก ๐๓๑๐(๑)/ ๑๐๖๙

ลงวันที่ ๒๘ มกราคม ๒๕๖๕

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๖๒ ราย

๑) นางสาวจินดา ไชจุลธรรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๐๘
๒) นางสาวสาวิตรี น้อยเสงี่ยม	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๐๙
๓) นางสาวชนัญฎาญจน์ อัมขม	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๐
๔) นางสาวนรินทร์ สายเส็ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๕
๕) นางสาวนันทวดี สมบูรณ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๖
๖) นางสาวศรัณยา เฉลิมธำรงค์	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๗
๗) นางสาวสรารัศม์ มงคลจิรวุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๙
๘) นางสาวศิริลักษณ์ พึ่งแพง	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๒๐
๙) นายณพพงศ์ จันทรพันธุ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๐๘
๑๐) นายนรเศรษฐ์ โกมลย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๑๑
๑๑) นายธันวา จริยา	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๑๔
๑๒) นางสาวเกศรินทร์ แก้วมัน	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๑๖
๑๓) นางสาวสุวิมล ชัยเรืองวุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๑๗
๑๔) นางสาวสุชาดา ธรรมถาวร	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๑
๑๕) นางสาวเปมิกา ชัยเดชธนกุล	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๓
๑๖) นางสาวศศิธร หมูสวัสดิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๔
๑๗) นางสาวเสาวลักษณ์ ภู่นาอำพร	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๕
๑๘) นายอภิสิทธิ์ สิงหา	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๖
๑๙) นายศักดิ์สิทธิ์ ไพศาลพิสุทธิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๗
๒๐) ว่าที่ร้อยตรีหญิง พรรณีภา ขำเจริญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๘
๒๑) นางจิตดา คำภูแก้ว	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๓๑
๒๒) นางสาวอรรวรรณ รักยง	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๑๕
๒๓) นางสาวนพรัตน์ แยมกรานต์	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๑๙
๒๔) นายจุลเดช วารินทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๐
๒๕) นางสาวดาญรัตน์ ร้องคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๑
๒๖) นายนคร สุขเจริญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๒
๒๗) นายบัญชา นามเขตต์	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๓
๒๘) นายพรมมี ศรีปัดเนตร	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๕
๒๙) นายอุทิศ อุ่นสิม	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๖
๓๐) ว่าที่ร้อยตรี เฉลิมเกียรติ อมรศรีเสริม	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๘
๓๑) นางสาววริยา สร้างนา	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๙
๓๒) นายอนุพงศ์ รัตนศรีประเสริฐ	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๓๐
๓๓) นางสาวจุฑารัตน์ โอนสันเทียะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๔๒
๓๔) นางสาวจรรวรรณ พิมพ์อริกฤติยา	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๗๖

(นายศิระ จันทรเจ็ด)

๓๕) นางสาวปรารค์ทิพย์...

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

สำนักงานสิ่งแวดล้อมและเฝ้าระวังมลพิษ



๓๕) นางสาวปรางค์ทิพย์ กิจไพศาลศักดิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๗๙
๓๖) นางสาวเตือนใจ ทางกลาง	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๐
๓๗) นางสาวจิราพร ศิริเวช	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๑
๓๘) นายวรกร ผุ้กรักษ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๓
๓๙) นายทง วิริยะสทกิจ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๔
๔๐) นายธนิธ เจนจบ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๕
๔๑) นายคณิศร ขำเพชร	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๖
๔๒) นายอรรคพล นิยมวิทยาพันธ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๗
๔๓) นายภูวิช พรหมสะอาด	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๘
๔๔) นายธนเดช โภคาพิพัฒน์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๙
๔๕) นายชวฤทธิ์ วงษ์จันทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๐
๔๖) นายอาทิตย์ ศรีเสน	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๑
๔๗) นายเจษดินทร์ คงศักดิ์ไทย	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๒
๔๘) นายจรัส บุญยิ่ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๕
๔๙) นายธนาณัติ เอนก	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๖
๕๐) นายอภิวัฒน์ ทุมหนู	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๗
๕๑) นางสาวสุภาขวัญ มาก	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๘
๕๒) นางสาวหัตพร ขวาลสมบูรณ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๐
๕๓) นางสาวธิดิมา บุญเพ็ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๑
๕๔) นางสาวกนกอร เข้มเพ็ชร	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๒
๕๕) นางสาวพัชรียา หงษ์สมดี	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๓
๕๖) นางสาวภาณิดา สุรวงศ์ตระกูล	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๔
๕๗) นางสาวภาณุมาศ นามวัฒน์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๕
๕๘) นางสาวอุไรรัตน์ ทิงสร้างแป้น	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๖
๕๙) นายธีรวัฒน์ ปวงสุข	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๗
๖๐) นายอิทธิพล ยะโส	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๘
๖๑) นายประพจน์ วรรณชูชัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๙
๖๒) นายชยธร พวงทิพย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๑๐
๖๓) นางสาวกนกวรรณ จันทบาล	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๑๑
๖๔) นางสาวเกษร หลักบุญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๑๒
๖๕) นายสิทธิโชค ธงเงิน	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๑๓
๖๖) นางศิวารณ ใจบุญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๐๕
๖๗) นางสาวพรรณธิดา พุ่มคง	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๐๘
๖๘) นางสาวศรณีย์ ยิ่งดี	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๐๙
๖๙) นายนวกัทร ศรีวิริยะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๐
๗๐) นายสุวิชา ทองอ่อน	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๑
๗๑) นายวิญญู บุญตะนัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๓

(นายศิระ จันทรเจ็ด)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

ปณิธานของกรมส่งเสริมการค้าระหว่างประเทศ

๗๒) นายสมบูรณ์...

๗๒) นายสมบุรณ์ บุตรจันทร์  
๗๓) นายวิรัตน์ ไชยชนะรา  
๗๔) นายนฤเบศน์ เพิ่มพูน  
๗๕) นายจิรณัฐ ขาวละออ  
๗๖) นายสมโภช วันสา  
๗๗) นายอัสรี นามบุรี  
๗๘) นายณัฐนันท์ ปานประเสริฐ  
๗๙) นายอัครเศรฐ จ่อสาว  
๘๐) นายประเสริฐ สุระพันธ์  
๘๑) นายอนุกุล จันทรเนียม  
๘๒) นายพิรพงษ์ ทองคุณปรีดา  
๘๓) นายนฤพล ทองนุช  
๘๔) นายอนุวัฒน์ ม่วงแพ  
๘๕) นายเจตศราวุฒิ ปัตตะมะ  
๘๖) นายกฤษณะ สายวรรณ  
๘๗) นายพิชัย บุญยงค์  
๘๘) นายภานุพงศ์ โหมวงศ์  
๘๙) นายสามารถ คุ่มปลี  
๙๐) นายสัญญาชัย โกศรีนาม  
๙๑) นายณัฐวุฒิ ศรีประเสริฐ  
๙๒) นายชวัลรัช นาคพนม  
๙๓) นายพงศธร ชัยทิพย์  
๙๔) ว่าที่ร้อยตรี ภาณุพงศ์ แสนศรี  
๙๕) นายสิทธิโชค ทาสีดา  
๙๖) นายธนากร อินสุตา  
๙๗) นางสาววรรณิษา ขาติวันชัย  
๙๘) นางสาวพิมพ์ตะวัน มินากุล  
๙๙) นางสาวเพชรรัตน์ สิงห์สมบุญ  
๑๐๐) นางสาวชญาณิน พรหมจันทร์  
๑๐๑) นายกীরติ ทวีราช  
๑๐๒) นายจักริน หมั่นวิชา  
๑๐๓) นายฉัตรชัย สุขเปี้ย  
๑๐๔) นายณรรนท ต๊ะทองคำ  
๑๐๕) นายดุลยพล สนนอก  
๑๐๖) นายทักษ์ดนัย อุบลศรี  
๑๐๗) นายธนศร นามะกฤษณา  
๑๐๘) นายธิตีพงศ์ บัวแดง

ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๔  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๕  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๖  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๗  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๘  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๙  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๐  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๑  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๒  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๓  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๔  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๕  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๖  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๗  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๘  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๙  
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ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๓๒  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๓๓  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๓๔  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๓๕  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๓๖  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๓๗  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๓๘  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๓๙  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๐  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๑  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๒  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๓  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๔  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๕  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๖  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๗  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๘  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๙  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๕๐  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๕๑  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๕๒  
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๕๓

(นายศิระ จันทรเจ็ด)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

ปภังกรอุตสาหกรรม

๑๐๙) นายนนทชัย...

๑๐๙) นายพนนพชัย อุปถัมภ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๔
๑๑๐) นายณัฐพล คุณสุทธิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๕
๑๑๑) นายณัฏฐวัฒน์ สาริน	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๖
๑๑๒) นายปิยะนัฐ พลมะศรี	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๗
๑๑๓) นายพงศ์สิริ โสมเขียว	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๘
๑๑๔) นายพีรพัฒน์ กำคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๙
๑๑๕) นายภาณุพงศ์ มานิตย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๐
๑๑๖) นายมงคล ผลาทิพย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๑
๑๑๗) นายมนุนิษฐ์ พูลศิริ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๒
๑๑๘) นายสิรินันท์ ทองอ้น	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๓
๑๑๙) นายอเนชา ทนสมัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๔
๑๒๐) นายอดิศักดิ์ ผมไผ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๕
๑๒๑) นายอนันตชัย วิสม	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๖
๑๒๒) นายณัฐดนัย เจือละออง	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๗
๑๒๓) นายวรวิธ ดินัก	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๘
๑๒๔) นายแสงตะวัน นະตะສັດ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๙
๑๒๕) นายยุทธพงศ์ รัตนะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๑๐
๑๒๖) นายชัยณัฐ ไซยะนิจ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๑๑
๑๒๗) นายวิศรุต ศรีธรรมมา	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๑๒
๑๒๘) นายพนนทกร เพ็อกผ่อง	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๑๓
๑๒๙) นายกำชัย สุทธะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๑๔
๑๓๐) นางสาวณัฐภรณ์ รักทะเล	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๑๙
๑๓๑) นางสาวประภาภรณ์ บุตรพรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๐
๑๓๒) นางสาวนิลาวัลย์ นามพรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๑
๑๓๓) นางสาวพัชรินทร์ แสนสร้อย	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๒
๑๓๔) นายไพรวลัย เปี่ยมพิมาย	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๓
๑๓๕) นางสาวศุภมาศ ทองมาก	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๔
๑๓๖) นางสาวลลิตา จิตรสว่าง	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๕
๑๓๗) นางสาวชไมพร เสิกภูเขียว	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๖
๑๓๘) นางสาวกฤติมาพร คำมีแก่น	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๗
๑๓๙) นางสาวสกุณรัตน์ ภาควุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๘
๑๔๐) นางสาวกาญจนา คงคุณ	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๙
๑๔๑) นางสาวไพรินทร์ ศรีรูปี	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๐
๑๔๒) นางสาวทิพนันดา ฝูยปัญญา	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๑
๑๔๓) นางสาวสาธิตา ปานทอง	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๒
๑๔๔) นางสาวอริสา ทองนวล	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๓
๑๔๕) นางสาวอริยา คำคลอง	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๔

(นายศิระ จันทร์เจิด)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

๑๔๖) นางสาวบุษดาภรณ์...

๑๔๖) นางสาวชุตานกรณ์ สุนทรสนาน	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๕
๑๔๗) นางสาวสุภารัตน์ นนท์ประสาท	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๖
๑๔๘) นางสาวรัชนีกร เนียมกลาง	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๗
๑๔๙) นางสาวกัญญารัตน์ ศรีนิลทา	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๘
๑๕๐) นางสาวอัญชลี คำจันทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๙
๑๕๑) นายบุญฤทธิ์ เอี่ยมเทศ	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๐
๑๕๒) นายศิริวัฒน์ พานิชย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๑
๑๕๓) นางสาวศุภรดา ปันมยุรา	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๒
๑๕๔) นางสาวพาฤดี คุณนาน	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๓
๑๕๕) นางสาวจิราเจต พองดา	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๔
๑๕๖) นางสาวกนกภรณ์ อุระ	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๕
๑๕๗) นางสาวอารยา มีชัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๖
๑๕๘) นางสาวจิตสุภา ประเทืองสุข	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๗
๑๕๙) นางสาวอริสา วิริยขันติธรรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๘
๑๖๐) นางสาววิชุดา นาคผจญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๙
๑๖๑) นางสาวพนิดา ยอดอินทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๕๐
๑๖๒) นางสาวนันทิยา จันทะลุน	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๕๑



(นายศิริระ จันท์เจ็ด)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม



เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

เลขทะเบียน ว-๒๐๔

ที่ อก ๐๓๑๐(๑)/ ๑๐๖๕

ลงวันที่ ๒๘ มกราคม ๒๕๖๕

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๖๑ รายการ

น้ำเสีย จำนวน 59 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldicarb	High-Performance Liquid Chromatographic Method <sup>[4]</sup>
2	Aldicarb Sulfone	High-Performance Liquid Chromatographic Method <sup>[4]</sup>
3	Aldicarb Sulfoxide	High-Performance Liquid Chromatographic Method <sup>[4]</sup>
4	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
5	Arsenic	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
6	Barium	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
7	$\alpha$ -BHC	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
8	$\beta$ -BHC	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
9	$\delta$ -BHC	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
10	$\gamma$ -BHC	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
11	Biochemical Oxygen Demand	1) 5-Day BOD Test, Azide Modification Method <sup>[4]</sup> 2) 5-Day BOD Test, Membrane Electrode Method <sup>[4]</sup>
12	Carbaryl	High-Performance Liquid Chromatographic Method <sup>[4]</sup>
13	Carbofuran	High-Performance Liquid Chromatographic Method <sup>[4]</sup>
14	Cadmium	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
15	Chemical Oxygen Demand	1) Closed Reflux, Colorimetric Method <sup>[4]</sup> 2) Closed Reflux, Titrimetric Method <sup>[4]</sup>
16	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
17	Chromium	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[4]</sup>
18	Color	ADMI Weighted-Ordinate Spectrophotometric Method



(นางริกาญจน์ จิตรสกุลไชย)

ผู้อำนวยการกลุ่มมาตรฐานวิชาการวิเคราะห์ทดสอบมลพิษ

และทะเบียนห้องปฏิบัติการ

19 Copper...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
19	Copper	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
20	Cyanide	Distillation, Colorimetric Method <sup>[4]</sup>
21	2,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
22	4,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
23	2,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
24	4,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
25	2,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
26	4,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
27	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
28	Endosulfan Sulfate	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
29	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
30	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
31	Endrin	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
32	Endrin Aldehyde	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
33	Formaldehyde	Distillation, Colorimetric Method <sup>[3]</sup>
34	Free Chlorine	1) DPD Ferrous Titrimetric Method <sup>[4]</sup> 2) Iodometric Method <sup>[4]</sup>
35	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
36	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
37	Hexavalent Chromium	Filtration, Colorimetric Method <sup>[4]</sup>
38	3-Hydroxycarbofuran	High-Performance Liquid Chromatographic Method <sup>[4]</sup>
39	Lead	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
40	Manganese	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
41	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/Mass spectrometric Method <sup>[4]</sup>
42	Methiocarb	High-Performance Liquid Chromatographic Method <sup>[4]</sup>
43	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>

วิมล

44 Methomyl...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
44	Methomyl	High-Performance Liquid Chromatographic Method <sup>[4]</sup>
45	Nickel	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
46	Oil & Grease	1) Liquid-Liquid, Partition-Gravimetric Method <sup>[4]</sup> 2) Soxhlet Extraction Method <sup>[4]</sup>
47	Oxamyl	High-Performance Liquid Chromatographic Method <sup>[4]</sup>
48	Propoxur	High-Performance Liquid Chromatographic Method <sup>[4]</sup>
49	pH	Electrometric Method <sup>[4]</sup>
50	Phenols	1) Distillation, Chloroform Extraction Method <sup>[4]</sup> 2) Distillation, Direct Photometric Method <sup>[4]</sup>
51	Selenium	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
52	Sulfide	Iodometric Method <sup>[4]</sup>
53	Temperature	Laboratory and Field Methods <sup>[4]</sup>
54	Total Dissolved Solids	Dried at 180 °C <sup>[4]</sup>
55	Total Kjeldahl Nitrogen	Semi-Micro Kjeldahl Method <sup>[4]</sup>
56	Total Suspended Solids	Dried at 103-105 °C <sup>[4]</sup>
57	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
58	Trivalent Chromium	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation <sup>[4]</sup>
59	Zinc	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[4]</sup>

น้ำใต้ดิน จำนวน 126 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
2	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>

วิภา

3 Aldrin...

(นางริภาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ  
และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
3	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
4	Anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
5	Antimony	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
7	Atrazine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
8	Barium	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
9	Benz(a)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
11	Benzo(b)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
12	Benzo(k)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
13	Benzoic Acid	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
14	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
15	Benzo[g,h,i]perylene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
17	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>

วิธีทาง)

18 Bis(2-ethylhexyl)phthalate...

(นางริกาญจน์ ฉัตรสกุลวิไล)

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และทะเบียนห้องปฏิบัติการ



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
21	Butanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
		Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
22	Butyl Benzyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
25	Carbon Disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
27	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
32	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
33	Chromium	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>



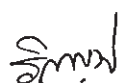
34 Chromium (III)...

(นางริกาญจน์ จิตรสกุลไธ)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
53	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
57	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
58	Diethyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
59	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
60	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
61	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
62	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
63	Di-n-Octyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
64	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
65	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
67	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>



(นางริกาญจน์ จิตรสกุลไชย)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ  
และทะเบียนห้องปฏิบัติการ

68 Fluorene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
68	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
69	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
70	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
73	n-Hexane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
74	$\alpha$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
75	$\beta$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
76	$\gamma$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
79	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
81	Lead	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
82	Manganese	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
83	Mercury	1) Cold Vapor Atomic Absorption Spectrometric Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>

วิมล

84 Methanol...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และหน่วยงานที่เกี่ยวข้อง



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
84	Methanol	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup> 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
85	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
89	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
91	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
92	Nickel	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
95	N-Nitrosodi-n-Propylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
96	Polychlorinated Biphenyls - PCB 1016 - PCB 1221 - PCB 1232 - PCB 1242 - PCB 1248 - PCB 1254 - PCB 1260	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>

วิมล

97 Pentachlorophenol...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
98	pH	Electrometric Method <sup>[4]</sup>
99	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
100	Phenol	1) Distillation, Direct Photometric Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
101	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
102	Selenium	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
103	Silver	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
104	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
105	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
106	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
107	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
108	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
109	TPH (C <sub>5</sub> -C <sub>8</sub> )	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,24]</sup>
110	TPH (C <sub>&gt;8</sub> -C <sub>16</sub> )	Solvent Extraction, Gas Chromatographic Method <sup>[9,21]</sup>
111	TPH (C <sub>&gt;16</sub> -C <sub>35</sub> )	Solvent Extraction, Gas Chromatographic Method <sup>[9,21]</sup>
112	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
113	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>

วิมล

114 1,1,2-Trichloroethane...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
114	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
115	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
116	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
117	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
118	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
119	Vanadium	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
120	Vinyl Acetate	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
121	Vinyl Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
122	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
123	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
124	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
125	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
126	Zinc	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>

**อากาศเสีย (ปล่อยระบาย) จำนวน 16 รายการ**

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	Isokinetic, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
2	Arsenic	Isokinetic, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>

*วิฑูรย์*

3 Carbon Monoxide...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และหน่วยงานที่เกี่ยวข้อง

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
3	Carbon Monoxide	1) Sampling Bag Non-Dispersive Infrared Method <sup>[5]</sup> 2) Non-Dispersive Infrared Method <sup>[5]</sup> 3) Instrumental Analyzer Method <sup>[5]</sup>
4	Chlorine	1) Absorption Sampling, Ion Chromatographic Method <sup>[5]</sup> 2) Isokinetic Sampling, Ion Chromatographic Method <sup>[5]</sup>
5	Copper	Isokinetic, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
6	Dioxins	Isokinetic Sampling, Analysis by ISO/IEC 17025 Accredited Laboratory or Analysis by Department of Industrial Works Registered Laboratory (Dioxins/Furans Analysis Approved) <sup>[5]</sup>
7	Hydrogen Chloride	1) Absorption Sampling, Ion Chromatographic Method <sup>[5]</sup> 2) Isokinetic Sampling, Ion Chromatographic Method <sup>[5]</sup>
8	Hydrogen Sulfide	Absorption Sampling, Iodometric Method <sup>[5]</sup>
9	Lead	Isokinetic, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
10	Mercury	1) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[5]</sup> 2) Isokinetic, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
11	Opacity	Ringelmann's Method <sup>[2]</sup>
12	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method <sup>[5]</sup> 2) Chemiluminescence Method <sup>[5]</sup> 3) Instrumental Analyzer Method <sup>[5]</sup>
13	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method <sup>[5]</sup> 2) UV Fluorescence Method <sup>[5]</sup> 3) Instrumental Analyzer Method <sup>[5]</sup>
14	Sulfuric Acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method <sup>[5]</sup>
15	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method <sup>[5]</sup>
16	Xylene	Adsorption Sampling, Gas Chromatographic Method <sup>[5]</sup>

วิมล

สิ่งปลูก...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิชาการวิเคราะห์ทดสอบมลพิษ



สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 35 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,25]</sup> 2) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic Method <sup>[22,31]</sup>
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,16]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,16]</sup>
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,16]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,16]</sup>
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,16]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,16]</sup>
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,16]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,16]</sup>



6 Cadmium...

(นางริกาญจน์ จิตรสกุลใจ)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,16]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,16]</sup>
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,19,25]</sup> 2) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic Method <sup>[22,31]</sup>
8	Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,16]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,16]</sup>
9	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation Method <sup>[1,6,15,17]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation Method <sup>[1,6,16,17]</sup> 3) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method <sup>[7,8,15,17]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method <sup>[7,8, 16,17]</sup>
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method <sup>[1,6,17]</sup> 2) Alkaline Digestion, Colorimetric Method <sup>[8,17]</sup>



(นางริกาญจน์ จิตรสกุลไชย)

11 Cobalt...

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

.....เรียน...../...../.....

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,16]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,16]</sup>
12	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,16]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,16]</sup>
13	2,4-D	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,25]</sup> 2) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic Method <sup>[22,31]</sup>
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,25]</sup> 2) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic Method <sup>[22,31]</sup>
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,25]</sup> 2) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic Method <sup>[22,31]</sup>
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,25]</sup>

จิราพร

2) Soxhlet...

(นางริภาญจน์ จัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	Dieldrin	2) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic Method <sup>[22,31]</sup> 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,25]</sup>
18	Endrin	2) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic Method <sup>[22,31]</sup> 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,25]</sup>
19	Heptachlor	2) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic Method <sup>[22,31]</sup> 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,25]</sup>
20	Lead	2) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic Method <sup>[22,31]</sup> 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,16]</sup>
21	Lindane	3) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,16]</sup> 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,25]</sup> 2) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup>
22	Mercury	3) Automated Soxhlet Extraction, Gas Chromatographic Method <sup>[22,31]</sup> 1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[1,6,18]</sup>

วิมล

2) Waste Extraction...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
23	Methoxychlor	2) Waste Extraction, Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method <sup>[1,6,19]</sup> 3) Waste Extraction, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method <sup>[1,6,20]</sup> 4) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[18]</sup> 5) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method <sup>[19]</sup> 6) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method <sup>[20]</sup>
24	Mirex	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,25]</sup> 2) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic Method <sup>[22,31]</sup>
25	Molybdenum	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,25]</sup> 2) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic Method <sup>[22,31]</sup>
26	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,16]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,16]</sup>
		1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,16]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,16]</sup>

วิภาดา

27 Polychlorinated...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
27	<p>Polychlorinated biphenyls (PCBs)</p> <ul style="list-style-type: none"> <li>- Aroclor 1016</li> <li>- Aroclor 1221</li> <li>- Aroclor 1232</li> <li>- Aroclor 1242</li> <li>- Aroclor 1248</li> <li>- Aroclor 1254</li> <li>- Aroclor 1260</li> <li>- 2-Chlorobiphenyl</li> <li>- 2,3-Dichlorobiphenyl</li> <li>- 2,2',5-Trichlorobiphenyl</li> <li>- 2,4',5-Trichlorobiphenyl</li> <li>- 2,2',3,5'-Tetrachlorobiphenyl</li> <li>- 2,2',5,5'-Tetrachlorobiphenyl</li> <li>- 2,3',4,4'-Tetrachlorobiphenyl</li> <li>- 2,2',3,4,5'-Pentachlorobiphenyl</li> <li>- 2,2',4,5,5'-Pentachlorobiphenyl</li> <li>- 2,3,3',4',6-Pentachlorobiphenyl</li> <li>- 2,2',3,4,4',5'-Hexachlorobiphenyl</li> <li>- 2,2',3,4,5,5'-Hexachlorobiphenyl</li> <li>- 2,2',3,5,5',6-Hexachlorobiphenyl</li> <li>- 2,2',4,4',5,5'-Hexachlorobiphenyl</li> <li>- 2,2',3,3',4,4',5-Heptachlorobiphenyl</li> <li>- 2,2',3,4,4',5,5'-Heptachlorobiphenyl</li> <li>- 2,2',3,4,4',5',6-Heptachlorobiphenyl</li> <li>- 2,2',3,4',5,5',6-Heptachlorobiphenyl</li> <li>- 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl</li> </ul>	<p>1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method<sup>[1,9,23]</sup></p> <p>2) Soxhlet Extraction, Gas Chromatographic Method<sup>[10,23]</sup></p> <p>3) Automated Soxhlet Extraction, Gas Chromatographic Method<sup>[22,31]</sup></p>

วิมล

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

28 Pentachlorophenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
28	Pentachlorophenol	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,25]</sup> 2) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic Method <sup>[22,31]</sup>
29	pH	Electrometric Method <sup>[29,30]</sup>
30	Selenium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,16]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,16]</sup>
31	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,16]</sup>
32	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,16]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,16]</sup>
33	Toxaphene	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,25]</sup> 2) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic Method <sup>[22,31]</sup>
34	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,16]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup>

วิมล

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิชาการวิเคราะห์ทดสอบมลพิษ

4) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
35	Zinc	4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,16]</sup> 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,16]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,16]</sup>

ดิน จำนวน 125 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
2	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
3	Aldrin	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
4	Anthracene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
5	Antimony	1) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,16]</sup>
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,16]</sup>
7	Atrazine	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
8	Barium	1) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,16]</sup>



(นางริกาณจน์ นิตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

9 Benz(a)anthracene...



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
9	Benz(a)anthracene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
11	Benzo(b)fluoranthene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
12	Benzo(k)fluoranthene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
13	Benzoic acid	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
14	Benzo(a)pyrene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
15	Benzo(g,h,i)perylene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,16]</sup>
17	Bis(2-chloroethyl)ether	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
18	Bis(2-ethylhexyl)phthalate	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
21	Butanol	Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method <sup>[12,24]</sup>
22	Butyl Benzyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,16]</sup>
24	Carbazole	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
25	Carbon Disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>

วิมล

26 Carbon tetrachloride...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
27	Chlordane	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
28	p-Chloroaniline	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
32	2-Chlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
33	Chromium	1) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,16]</sup>
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method <sup>[7,8,15,17]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method <sup>[7,8,16,17]</sup>
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method <sup>[8,17]</sup>
36	Chrysene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
37	Cyanide	Extraction, Distillation, Colorimetric Method <sup>[26,27,28]</sup>
38	2,4-D	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
39	DDD	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>

วิฑูรย์

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิชาการวิเคราะห์ทดสอบมลพิษ

40 DDE...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
40	DDE	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
41	DDT	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
42	Dibenz(a,h)anthracene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
43	Di-n-Butyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[14,24]</sup>
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[14,24]</sup>
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[14,24]</sup>
47	3,3-Dichlorobenzidine	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[14,24]</sup>
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[14,24]</sup>
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[14,24]</sup>
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[14,24]</sup>
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[14,24]</sup>
53	2,4-Dichlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[14,24]</sup>
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[14,24]</sup>
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[14,24]</sup>

วิมล

(นางริกาญจน์ ฉัตรสกุลวิไล)

57 Dieldrin...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
57	Dieldrin	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
58	Diethyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
59	2,4-Dimethylphenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
60	2,4-Dinitrophenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
61	2,4-Dinitrotoluene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
62	2,6-Dinitrotoluene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
63	Di-n-Octyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
64	Endosulfan	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
65	Endrin	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[14,24]</sup>
67	Fluoranthene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
68	Fluorene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
69	Heptachlor	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
70	Heptachlor Epoxide	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
71	Hexachlorobenzene	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[14,24]</sup>
73	n-Hexane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[14,24]</sup>
74	$\alpha$ -HCH	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
75	$\beta$ -HCH	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
76	$\gamma$ -HCH	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
77	Hexachlorocyclopentadiene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
78	Hexachloroethane	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
79	Indeno(1,2,3-cd)pyrene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
80	Isophorone	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
81	Lead	1) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,16]</sup>
82	Manganese	1) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,16]</sup>
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[18]</sup>



(นางริกาญจน์ จิตตรัสกุลไชโย)

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และหน่วยงานห้องปฏิบัติการ

2) Thermal...



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
84	Methanol	2) Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry <sup>[19]</sup> 3) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method <sup>[20]</sup> Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method <sup>[12,24]</sup>
85	Methoxychlor	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[14,24]</sup>
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[14,24]</sup>
88	2-methylphenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
89	2-Methylnaphthalene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[14,24]</sup>
91	Naphthalene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
92	Nickel	1) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,16]</sup>
93	Nitrobenzene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
94	N-Nitrosodiphenylamine	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
95	N-Nitrosodi-n-propylamine	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
96	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,23]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic Method <sup>[23,32]</sup>

วิฑูรย์

(นางริกาญจน์ ฉัตรสกุลวิไล)

- Aroclor 1242...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
	<ul style="list-style-type: none"> <li>- Aroclor 1242</li> <li>- Aroclor 1248</li> <li>- Aroclor 1254</li> <li>- Aroclor 1260</li> <li>- 2-Chlorobiphenyl</li> <li>- 2,2',3,5'-Tetrachlorobiphenyl</li> <li>- 2,2',5,5'-Tetrachlorobiphenyl</li> <li>- 2,3',4,4'-Tetrachlorobiphenyl</li> <li>- 2,2',3,4,5'-Pentachlorobiphenyl</li> <li>- 2,2',4,5,5'-Pentachlorobiphenyl</li> <li>- 2,3,3',4',6-Pentachlorobiphenyl</li> <li>- 2,2',3,4,4',5'-Hexachlorobiphenyl</li> <li>- 2,2',3,4,5,5'-Hexachlorobiphenyl</li> <li>- 2,2',3,5,5',6-Hexachlorobiphenyl</li> <li>- 2,2',4,4',5,5'-Hexachlorobiphenyl</li> <li>- 2,2',3,3',4,4',5-Heptachlorobiphenyl</li> <li>- 2,2',3,4,4',5,5'-Heptachlorobiphenyl</li> <li>- 2,2',3,4,4',5',6-Heptachlorobiphenyl</li> <li>- 2,2',3,4',5,5',6-Heptachlorobiphenyl</li> <li>- 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl</li> </ul>	
97	Pentachlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
98	Phenanthrene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
99	Phenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>
100	Pyrene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[25,31]</sup>

วิกรม

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ  
และทะเบียนห้องปฏิบัติการ

101 Selenium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
101	Selenium	1) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,16]</sup>
102	Silver	1) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,16]</sup>
103	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
106	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
107	Toxaphene	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
108	TPH (C <sub>5</sub> -C <sub>8</sub> )	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
109	TPH (C <sub>8</sub> - C <sub>16</sub> )	1) Solvent Extraction, Gas Chromatographic Method <sup>[11,21]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic Method <sup>[21,31]</sup>
110	TPH (C <sub>16</sub> - C <sub>35</sub> )	1) Solvent Extraction, Gas Chromatographic Method <sup>[11,21]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic Method <sup>[21,31]</sup>
111	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
112	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
113	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
114	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
115	2,4,5-Trichlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>

วิมล

116 2,4,6-Trichlorophenol...

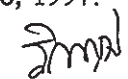
(นางริกาญจน์ ฉัตรสกุลวิไล)

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
116	2,4,6-Trichlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[25,31]</sup>
117	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
118	Vanadium	1) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,16]</sup>
119	Vinyl Acetate	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
120	Vinyl Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
121	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
122	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
123	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
124	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,24]</sup>
125	Zinc	1) Digestion, Inductively Coupled Plasma Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,16]</sup>

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และทะเบียนห้องปฏิบัติการ