

## ภาคผนวก 9

# เอกสารชี้แนะเขียนห้องปฏิบัติการ วิเคราะห์เอกสารชน



ที่ อก ๐๓๑๐(๑)/๑๒๗๑๔

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๘ กันยายน ๒๕๖๕

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท ศูนย์วิเคราะห์น้ำ จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารเคมีของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๑๑ พฤษภาคม ๒๕๖๕

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
บริษัท ศูนย์วิเคราะห์น้ำ จำกัด จำนวน ๑๐ แผ่น

ตามหนังสือที่อ้างถึง บริษัท ศูนย์วิเคราะห์น้ำ จำกัด ขอต่ออายุหนังสือรับขึ้นทะเบียน  
ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๑๙๐ สถานที่ตั้งเลขที่ ๑/๙๔ หมู่ที่ ๕ ตำบลคานหาม อำเภออุทัย  
จังหวัดพระนครศรีอยุธยา ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท ศูนย์วิเคราะห์น้ำ จำกัด ต่ออายุหนังสือรับขึ้นทะเบียน  
ห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์

- |                            |                            |
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| ๑) นางนิรมล ผดุงสงฆ์       | ทะเบียนเลขที่ ๖-๑๙๐-ก-๐๐๐๑ |
| ๒) นางสาวเปรมฤดี ชิวเศรษฐ์ | ทะเบียนเลขที่ ๖-๑๙๐-ก-๐๐๐๒ |
| ๓) นางสาวนิตยา ชันธบุตร    | ทะเบียนเลขที่ ๖-๑๙๐-ก-๐๐๐๓ |
| ๔) นางสาวจุฑารัตน์ ภูผาน   | ทะเบียนเลขที่ ๖-๑๙๐-ก-๐๐๐๔ |

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์

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|-----------------------------|----------------------------|
| ๑) นางสาวอนุสรฯ พงศ์ดวงแก้ว | ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๐๑ |
| ๒) นายรังศศิกร โกสุมภ์      | ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๐๒ |
| ๓) นางสาวสุวิทย์ บังแสงอ่อน | ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๐๓ |
| ๔) นางสาววราพร วันวิเศษ     | ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๐๔ |
| ๕) นางสาวนันทา แจ่มมิน      | ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๐๕ |
| ๖) นายพุดผกษณ์ วรสมันต์     | ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๐๖ |
| ๗) นางสาวอรรณณ สี่ใต้       | ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๐๗ |
| ๘) นายวชิราวุฒิ อุไรวรรณ    | ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๐๘ |
| ๙) นางสาวคณิตศรา สร้อยจิตร  | ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๐๙ |
| ๑๐) นางสาวรณกร ผดุงเวียง    | ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๑๐ |
| ๑๑) นายมานพ สลามขอ          | ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๑๑ |
| ๑๒) นายจตุเมธ อินทรโสภาส    | ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๑๒ |
| ๑๓) นางสาวแคทรียา มีแก้ว    | ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๑๓ |
| ๑๔) นางสาวอัญชิสา แผลงศรี   | ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๑๔ |
| ๑๕) นายรัตพล ไบโกร          | ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๑๕ |

๑๖) นางสาวสมมาต...

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๑๖) นางสาวสมมาต อยู่สา	ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๑๖
๑๗) นายภูเบศร์ สารยศ	ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๑๗
๑๘) นางสาวกันขญา อาจโยธา	ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๑๘
๑๙) นายสุทิวส์ ใจธีรภาพกุล	ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๑๙
๒๐) นายธนกฤต สุจริต	ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๒๐
๒๑) นางสาวกนกพร หลวงประมูล	ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๒๑
๒๒) นางสาวณิชา แก้วรุ่งฟ้า	ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๒๒
๒๓) นางสาวสุธาสิณี หอมสวาท	ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๒๓
๒๔) นางสาวเครือวัลลี สมภักษ์	ทะเบียนเลขที่ ๖-๑๙๐-จ-๐๐๒๔

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย น้ำใต้ดิน สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว และดิน ตามสิ่งที่ส่งมาด้วย

หนังสือฉบับนี้จะหมดอายุในวันที่ ๑๖ มิถุนายน ๒๕๖๘ หากประสงค์จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม ตาม QR Codeท้ายหนังสือฉบับนี้

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

  
(นางจินดา เดชะศรีนทร์)

ผู้อำนวยการกองวิจัยและเฝ้าระวังมลพิษโรงงาน  
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม



ยื่นคำขอผ่านระบบอิเล็กทรอนิกส์

กองวิจัยและเฝ้าระวังมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๙๙

ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th



“อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว”



เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท ศูนย์วิเคราะห์น้ำ จำกัด

เลขทะเบียน ว-๑๙๐

ที่ อก ๐๓๑๐(๑)๑๒๗๑๔

ลงวันที่ ๘ กันยายน ๒๕๖๕

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๑๒๙ รายการ

น้ำเสีย จำนวน 44 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
2	Arsenic	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[3]</sup>
3	Barium	Digestion, Direct Nitrous Oxide Acetylene Flame Method <sup>[3]</sup>
4	α-BHC	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
5	β-BHC	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
6	γ-BHC	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
7	δ-BHC	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
8	Biochemical Oxygen Demand	1) 5-Day BOD Test, Azide Modification Method <sup>[3]</sup> 2) 5-Day BOD Test, Membrane Electrode Method <sup>[3]</sup>
9	Cadmium	1) Digestion, Direct Air-Acetylene Flame Method <sup>[3]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[3]</sup>
10	Chemical Oxygen Demand	Closed Reflux, Titrimetric Method <sup>[3]</sup>
11	Chromium	Digestion, Direct Air-Acetylene Flame Method <sup>[3]</sup>
12	Color	ADMI Weighted-Ordinate Spectrophotometric Method <sup>[3]</sup>
13	Copper	Digestion, Direct Air-Acetylene Flame Method <sup>[3]</sup>
14	Cyanide	Distillation, Colorimetric Method <sup>[3]</sup>
15	4,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
16	4,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>

17 4,4'-DDT ...

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	4,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
18	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
19	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
20	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
21	Endosulfan Sulfate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
22	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
23	Endrin Aldehyde	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
24	Formaldehyde	Distillation, Colorimetric Method <sup>[2]</sup>
25	Free Chlorine	DPD Colorimetric Method <sup>[3]</sup>
26	Hexavalent Chromium	Filtration, Colorimetric Method <sup>[3]</sup>
27	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
28	Heptachlor Epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
29	Lead	1) Digestion, Direct Air-Acetylene Flame Method 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[3]</sup>
30	Manganese	Digestion, Direct Air-Acetylene Flame Method <sup>[3]</sup>
31	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[3]</sup>
32	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
33	Nickel	Digestion, Direct Air-Acetylene Flame Method <sup>[3]</sup>
34	Oil & Grease	Soxhlet Extraction Method <sup>[3]</sup>
35	pH	Electrometric Method <sup>[3]</sup>

36 Phenol...

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
36	Phenol	Distillation, Direct Photometric Method <sup>[3]</sup>
37	Selenium	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[3]</sup>
38	Sulfide	Precipitation, Iodometric Method <sup>[3]</sup>
39	Temperature	Laboratory and Field Methods <sup>[3]</sup>
40	Total Dissolved Solids	Dried at 180 °C <sup>[3]</sup>
41	Total Kjeldahl Nitrogen	Macro Kjeldahl, Titrimetric Method <sup>[3]</sup>
42	Total Suspended Solids	Dried at 103-105 °C <sup>[3]</sup>
43	Trivalent Chromium	Digestion, Direct Air-Acetylene Flame Method; Filtration, Colorimetric Method; Calculation <sup>[3]</sup>
44	Zinc	Digestion, Direct Air-Acetylene Flame Method <sup>[3]</sup>

น้ำใต้ดิน จำนวน 31 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
2	Antimony	Digestion, Direct Air-Acetylene Flame Method <sup>[3]</sup>
3	Arsenic	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[3]</sup>
4	Barium	Digestion, Direct Nitrous Oxide-Acetylene Flame Method <sup>[3]</sup>
5	Beryllium	Digestion, Direct Nitrous Oxide-Acetylene Flame Method <sup>[3]</sup>
6	Cadmium	1) Digestion, Direct Air-Acetylene Flame Method <sup>[3]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[3]</sup>
7	Chromium	Digestion, Direct Air-Acetylene Flame Method <sup>[3]</sup>
8	Chromium (III)	Digestion, Direct Air-Acetylene Flame Method; Filtration, Colorimetric Method; Calculation <sup>[3]</sup>
9	Chromium (VI)	Filtration, Colorimetric Method <sup>[3]</sup>
10	Cyanide	Distillation, Colorimetric Method <sup>[3]</sup>
11	DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup> ว่าง

12 DDE...



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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
12	DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
13	DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
14	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
15	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
16	$\alpha$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
17	$\beta$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
18	$\gamma$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
19	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
20	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
21	Lead	1) Digestion, Direct Air-Acetylene Flame Method <sup>[3]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[3]</sup>
22	Manganese	Digestion, Direct Air-Acetylene Flame Method <sup>[3]</sup>
23	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[3]</sup>
24	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[3]</sup>
25	Nickel	Digestion, Direct Air-Acetylene Flame Method <sup>[3]</sup>
26	pH	Electrometric Method <sup>[3]</sup>
27	Phenols	Distillation, Direct Photometric Method <sup>[3]</sup>
28	Selenium	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[3]</sup>
29	Silver	Digestion, Direct Air-Acetylene Flame Method <sup>[3]</sup>

30 Vanadium...

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
30	Vanadium	Digestion, Direct Nitrous Oxide-Acetylene Flame Method <sup>[3]</sup>
31	Zinc	Digestion, Direct Air-Acetylene Flame Method <sup>[3]</sup>

สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 25 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,6,14]</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[6,14]</sup>
2	Antimony	1) Waste Extraction, Digestion, Direct Air-Acetylene Flame Method <sup>[1,8]</sup> 2) Digestion, Direct Air-Acetylene Flame Method <sup>[4,8]</sup>
3	Arsenic	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[1,9]</sup> 2) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[4,9]</sup>
4	Barium	1) Waste Extraction, Digestion, Direct Nitrous Oxide-Acetylene Flame Method <sup>[1,8]</sup> 2) Digestion, Direct Nitrous Oxide-Acetylene Flame Method <sup>[4,8]</sup>
5	Beryllium	1) Waste Extraction, Digestion, Direct Nitrous Oxide-Acetylene Flame Method <sup>[1,8]</sup> 2) Digestion, Direct Nitrous Oxide-Acetylene Flame Method <sup>[4,8]</sup>
6	Cadmium	1) Waste Extraction, Digestion, Direct Air-Acetylene Flame Method <sup>[1,8]</sup> 2) Digestion, Direct Air-Acetylene Flame Method <sup>[4,8]</sup>
7	Chromium	1) Waste Extraction, Digestion, Direct Air-Acetylene Flame Method <sup>[1,8]</sup> 2) Digestion, Direct Air-Acetylene Flame Method <sup>[4,8]</sup>
8	Chromium (VI)	1) Waste Extraction, Colorimetric Method <sup>[1,10]</sup> 2) Digestion, Colorimetric Method <sup>[7,10]</sup>

9 Copper...



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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
9	Copper	1) Waste Extraction, Digestion, Direct Air-Acetylene Flame Method <sup>[1,8]</sup> 2) Digestion, Direct Air-Acetylene Flame Method <sup>[4,8]</sup>
10	DDD	1) Waste Extraction, Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,5,14]</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[6,14]</sup>
11	DDE	1) Waste Extraction, Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,5,14]</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[6,14]</sup>
12	DDT	1) Waste Extraction, Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,5,14]</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[6,14]</sup>
13	Dieldrin	1) Waste Extraction, Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,5,14]</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[6,14]</sup>
14	Endrin	1) Waste Extraction, Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,5,14]</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[6,14]</sup>
15	Heptachlor	1) Waste Extraction, Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,5,14]</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[6,14]</sup>
16	Lead	1) Waste Extraction, Digestion, Direct Air-Acetylene Flame Method <sup>[1,8]</sup> 2) Digestion, Direct Air-Acetylene Flame Method <sup>[4,8]</sup>

17 Lindane...

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	Lindane	1) Waste Extraction, Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,5,14)</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(6,14)</sup>
18	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(1,11)</sup> 2) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(6,12)</sup>
19	Methoxychlor	1) Waste Extraction, Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,5,14)</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(6,14)</sup>
20	Nickel	1) Waste Extraction, Digestion, Direct Air-Acetylene Flame Method <sup>(1,8)</sup> 2) Digestion, Direct Air-Acetylene Flame Method <sup>(4,8)</sup>
21	pH	Electrometric Method <sup>(16)</sup>
22	Selenium	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(1,13)</sup> 2) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(6,13)</sup>
23	Silver	1) Waste Extraction, Digestion, Direct Air-Acetylene Flame Method <sup>(1,8)</sup> 2) Digestion, Direct Air-Acetylene Flame Method <sup>(4,8)</sup>
24	Vanadium	1) Waste Extraction, Digestion, Direct Air-Acetylene Flame Method <sup>(1,8)</sup> 2) Digestion, Direct Air-Acetylene Flame Method <sup>(4,8)</sup>
25	Zinc	1) Waste Extraction, Digestion, Direct Air-Acetylene Flame Method <sup>(1,8)</sup> 2) Digestion, Direct Air-Acetylene Flame Method <sup>(4,8)</sup>

ดิน...

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ดิน จำนวน 29 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[6,14]</sup>
2	Antimony	Digestion, Direct Air-Acetylene Flame Method <sup>[4,8]</sup>
3	Arsenic	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[4,9]</sup>
4	Barium	Digestion, Direct Air-Acetylene Flame Method <sup>[4,8]</sup>
5	Beryllium	Digestion, Direct Air-Acetylene Flame Method <sup>[4,8]</sup>
6	Cadmium	Digestion, Direct Air-Acetylene Flame Method <sup>[4,8]</sup>
7	Chromium	Digestion, Direct Air-Acetylene Flame Method <sup>[4,8]</sup>
8	Chromium (III)	Digestion, Direct Air-Acetylene Flame, Colorimetric Method; Calculation <sup>[4,5,7,10]</sup>
9	Chromium (VI)	Digestion, Colorimetric Method <sup>[7,10]</sup>
10	Cyanide	Cyanide Extraction Method <sup>[15]</sup>
11	DDD	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[6,14]</sup>
12	DDE	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[6,14]</sup>
13	DDT	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[6,14]</sup>
14	Dieldrin	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[6,14]</sup>
15	Endrin	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[6,14]</sup>
16	$\alpha$ -HCH	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[6,14]</sup>
17	$\beta$ -HCH	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[6,14]</sup>
18	$\gamma$ -HCH	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[6,14]</sup>

19 Heptachlor...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
19	Heptachlor	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[6,14]</sup>
20	Heptachlor epoxide	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[6,14]</sup>
21	Lead	Digestion, Direct Air-Acetylene Flame Method <sup>[4,8]</sup>
22	Manganese	Digestion, Direct Air-Acetylene Flame Method <sup>[4,8]</sup>
23	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[4,12]</sup>
24	Methoxychlor	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[6,14]</sup>
25	Nickel	Digestion, Direct Air-Acetylene Flame Method <sup>[4,8]</sup>
26	Selenium	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[4,13]</sup>
27	Silver	Digestion, Direct Air-Acetylene Flame Method <sup>[4,8]</sup>
28	Vanadium	Digestion, Direct Air-Acetylene Flame Method <sup>[4,8]</sup>
29	Zinc	Digestion, Direct Air-Acetylene Flame Method <sup>[4,8]</sup>

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*Signature*





ที่ อก ๐๓๑๐(๑)/ ๗๗๗ ๓

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

**๒๘ เมษายน ๒๕๖๖**

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท ศูนย์วิเคราะห์น้ำ จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๒๙ มีนาคม ๒๕๖๖

ตามหนังสือที่อ้างถึง บริษัท ศูนย์วิเคราะห์น้ำ จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๑๔๐ สถานที่ตั้งเลขที่ ๑/๔๔ หมู่ที่ ๕ ตำบลคานหาม อำเภออุทัย จังหวัดพระนครศรีอยุธยา ขอเปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์ ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๔ ราย

๑) นายจตุเมธ อินทรโณภาส	ทะเบียนเลขที่ ๖-๑๔๐-จ-๐๐๑๒
๒) นางสาวณิชา แก้วรุ่งฟ้า	ทะเบียนเลขที่ ๖-๑๔๐-จ-๐๐๒๒
๓) นางสาวสุธาสินี หอมสวาท	ทะเบียนเลขที่ ๖-๑๔๐-จ-๐๐๒๓
๔) นางสาวเครือวัลย์ สมภักษ์	ทะเบียนเลขที่ ๖-๑๔๐-จ-๐๐๒๔

๒. ให้เพิ่มเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๕ ราย

๑) นางสาวอาภรณ์ แซ่เอื้อ	ทะเบียนเลขที่ ๖-๑๔๐-จ-๐๐๒๕
๒) นางสาวทิพรรัตน์ ทองเย็น	ทะเบียนเลขที่ ๖-๑๔๐-จ-๐๐๒๖
๓) นายนิเทศ พูลศรี	ทะเบียนเลขที่ ๖-๑๔๐-จ-๐๐๒๗
๔) นายจิตติวีร์ วงศ์หมากเห็บ	ทะเบียนเลขที่ ๖-๑๔๐-จ-๐๐๒๘
๕) นายกฤษณะ ธรรมชัย	ทะเบียนเลขที่ ๖-๑๔๐-จ-๐๐๒๙

อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน คือในวันที่ ๑๖ มิถุนายน ๒๕๖๘ ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

  
(นายประสม ดำรงพงษ์)  
ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน  
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม


กองวิจัยและเตือนภัยมลพิษโรงงาน  
กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ  
โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕  
โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๔๔  
ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th



“อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว”







Ref No. : 0303/17008

**CERTIFICATE OF TESTING LABORATORY ACCREDITATION**


This is to certify that

*Laboratory of Water Analysis Center Co., Ltd.*  
*1/94 Moo 5, Tambon Kanharm, Amphoe U-Thai,*  
*Changwat Phra Nakhon Si Ayutthaya 13210*

has successfully undergone assessment according to ISO/IEC 17025 : 2017  
and under the Bureau of Laboratory Accreditation, Department of Science Service  
for the requirements, regulations and criteria for the competence of testing laboratories

**LABORATORY ACCREDITATION**  
**Accreditation Number TESTING - 0029**  
**BLA-DSS**

The scope of accreditation is as annexed hereto

Issue date : 7<sup>th</sup> November 2022  
Expired date : 6<sup>th</sup> November 2026  
Signature :   
(Mrs. Pochaman Tagheen)  
Director of Bureau of Laboratory Accreditation

Bureau of Laboratory Accreditation, Department of Science Service,  
Ministry of Higher Education, Science, Research and Innovation

Reference No. : 0303/17008

### Scope of Testing Laboratory Accreditation

Laboratory Name : Laboratory of Water Analysis Center Co., Ltd.

Address : 1/94 Moo 5, Tambon Kanharm, Amphoe U-Thai,  
Changwat Phra Nakhon Si Ayutthaya 13210

Accreditation Number : Testing - 0029

Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
1	Bottled drinking water	- Chloride 6 mg/L to 1 000 mg/L  - Total hardness (Calculated as CaCO <sub>3</sub> ) 5 mg/L to 2 000 mg/L  - Total solids dried at 103 °C to 105 °C 25 mg/L to 4 000 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 4500-Cl B  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 2340 C  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 2540 B

Initial Issue Date 23<sup>rd</sup> September 2008

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Accreditation Number : Testing - 0029

Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
1 (cont.)	Bottled drinking water	- Manganese 0.05 mg/L to 5 mg/L  - Iron 0.10 mg/L to 5 mg/L  - Cadmium 1 µg/L to 5 µg/L  - Lead 10 µg/L to 50 µg/L  - pH 6.0 to 8.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 3111 B, 3030 E  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 3113 B, 3030 E  In - house method : TM 001 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 4500-H <sup>+</sup> B

Initial Issue Date 23<sup>rd</sup> September 2008

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Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
2	Water	<p>- pH 6.0 to 10.0</p> <p>- Total suspended solids dried at 103 °C to 105 °C 10 mg/L to 1 000 mg/L</p> <p>- Total dissolved solids dried at 180 °C 25 mg/L to 4 000 mg/L</p>	<p>In - house method : TM 001 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA &amp; WEF, 23<sup>rd</sup> ed., 2017, part 4500-H<sup>+</sup> B</p> <p>Standard Methods for the Examination of Water and Wastewater, APHA, AWWA &amp; WEF, 23<sup>rd</sup> ed., 2017, part 2540 D</p> <p>Standard Methods for the Examination of Water and Wastewater, APHA, AWWA &amp; WEF, 23<sup>rd</sup> ed., 2017, part 2540 C</p>

Initial Issue Date 23<sup>rd</sup> September 2008

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
2 (cont.)	Water	- Cadmium 0.02 mg/L to 0.9 mg/L - Copper 0.05 mg/L to 5 mg/L - Zinc 0.05 mg/L to 5 mg/L - Chromium 0.05 mg/L to 5 mg/L - Nickel 0.10 mg/L to 4 mg/L - Manganese 0.05 mg/L to 5 mg/L - Lead 0.10 mg/L to 2 mg/L - Iron 0.10 mg/L to 5 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 3111 B, 3030 E

Initial Issue Date 23<sup>rd</sup> September 2008

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Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
2 (cont.)	Water	<p>- Water soluble silica (Calculated as <math>\text{SiO}_2</math>) 1.1 mg/L to 26 mg/L</p> <p>- Chloride 6 mg/L to 1 000 mg/L</p> <p>- Total hardness (Calculated as <math>\text{CaCO}_3</math>) 5 mg/L to 2 000 mg/L</p>	<p>Standard Methods for the Examination of Water and Wastewater, APHA, AWWA &amp; WEF, 23<sup>rd</sup> ed., 2017, part 4500-<math>\text{SiO}_2</math> C</p> <p>Standard Methods for the Examination of Water and Wastewater, APHA, AWWA &amp; WEF, 23<sup>rd</sup> ed., 2017, part 4500-Cl<sup>-</sup> B</p> <p>Standard Methods for the Examination of Water and Wastewater, APHA, AWWA &amp; WEF, 23<sup>rd</sup> ed., 2017, part 2340 C</p>

Initial Issue Date 23<sup>rd</sup> September 2008

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
2 (cont.)	Water	- BOD 2 mg/L to 500 mg/L	In - house method : TM 041 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 5210 B
		- BOD 2 mg/L to 500 mg/L	In - house method : TM 013 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 5210 B, part 4500-O C
		- COD 40 mg/L to 200 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 5220 C

Initial Issue Date 23<sup>rd</sup> September 2008

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Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
2 (cont.)	Water	- Total Kjeldahl Nitrogen 5 mg/L to 200 mg/L  - Oil and grease 2 mg/L to 100 mg/L  - Total solids dried at 103 °C to 105 °C 25 mg/L to 4 000 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 4500-NH <sub>3</sub> C, part 4500-N <sub>org</sub> B  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 5520 D  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 2540 B

Initial Issue Date 23<sup>rd</sup> September 2008

Issue Number 13

Bureau of Laboratory Accreditation, Department of Science Service, Ministry of Higher Education, Science, Research and Innovation

LA-F31-9/11-19

page 7/14

Reference No. : 0303/17008

### Scope of Testing Laboratory Accreditation

Laboratory Name : Laboratory of Water Analysis Center Co., Ltd.

Address : 1/94 Moo 5, Tambon Kanharm, Amphoe U-Thai,  
Changwat Phra Nakhon Si Ayutthaya 13210

Accreditation Number : Testing - 0029

Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
2 (cont.)	Water	- Selenium 5 µg/L to 50 µg/L  - Arsenic 5 µg/L to 50 µg/L  - Barium 0.5 mg/L to 5 mg/L  - Cadmium 1 µg/L to 5 µg/L  - Lead 10 µg/L to 50 µg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 3114 C   Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 3111 D, 3030 E   Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 3113 B, 3030 E

Initial Issue Date 23<sup>rd</sup> September 2008

Issue Number 13

Bureau of Laboratory Accreditation, Department of Science Service, Ministry of Higher Education, Science, Research and Innovation

Reference No. : 0303/17008

### Scope of Testing Laboratory Accreditation

Laboratory Name : Laboratory of Water Analysis Center Co., Ltd.

Address : 1/94 Moo 5, Tambon Kanharm, Amphoe U-Thai,  
Changwat Phra Nakhon Si Ayutthaya 13210

Accreditation Number : Testing - 0029

Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
3	Wastewater	<p>- pH 4.0 to 10.0</p> <p>- Total suspended solids dried at 103 °C to 105 °C 10 mg/L to 1 000 mg/L</p> <p>- Total dissolved solids dried at 180 °C 50 mg/L to 4 000 mg/L</p>	<p>In - house method : TM 001 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA &amp; WEF, 23<sup>rd</sup> ed., 2017, part 4500 - H<sup>+</sup> B</p> <p>Standard Methods for the Examination of Water and Wastewater, APHA, AWWA &amp; WEF, 23<sup>rd</sup> ed., 2017, part 2540 D</p> <p>Standard Methods for the Examination of Water and Wastewater, APHA, AWWA &amp; WEF, 23<sup>rd</sup> ed., 2017, part 2540 C</p>

Initial Issue Date 23<sup>rd</sup> September 2008 Issue Number 13

Bureau of Laboratory Accreditation, Department of Science Service, Ministry of Higher Education, Science, Research and Innovation

LA-F-31-9/11-19 page 9/14

Reference No. : 0303/17008

### Scope of Testing Laboratory Accreditation

Laboratory Name : Laboratory of Water Analysis Center Co., Ltd.  
Address : 1/94 Moo 5, Tambon Kanharm, Amphoe U-Thai,  
Changwat Phra Nakhon Si Ayutthaya 13210

Accreditation Number : Testing - 0029

Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
3 (cont.)	Wastewater	- Cadmium 0.02 mg/L to 0.9 mg/L - Copper 0.05 mg/L to 5 mg/L - Zinc 0.05 mg/L to 5 mg/L - Chromium 0.05 mg/L to 5 mg/L - Nickel 0.10 mg/L to 4 mg/L - Manganese 0.05 mg/L to 5 mg/L - Lead 0.10 mg/L to 2 mg/L - Iron 0.10 mg/L to 5 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 3111 B, 3030 E

Initial Issue Date 23<sup>rd</sup> September 2008

Issue Number 13

Bureau of Laboratory Accreditation, Department of Science Service, Ministry of Higher Education, Science, Research and Innovation

Reference No. : 0303/17008

### Scope of Testing Laboratory Accreditation

Laboratory Name : Laboratory of Water Analysis Center Co., Ltd.

Address : 1/94 Moo 5, Tambon Kanharm, Amphoe U-Thai,  
Changwat Phra Nakhon Si Ayutthaya 13210

Accreditation Number : Testing - 0029

Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
3 (cont.)	Wastewater	- Total hardness (Calculated as CaCO <sub>3</sub> ) 5 mg/L to 2 000 mg/L  - BOD 4 mg/L to 7 000 mg/L  - BOD 4 mg/L to 7 000 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 2340 C  In - house method : TM 041 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 5210 B  In - house method : TM 013 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 5210 B, part 4500-O C

Initial Issue Date 23<sup>rd</sup> September 2008 Issue Number 13

Bureau of Laboratory Accreditation, Department of Science Service, Ministry of Higher Education, Science, Research and Innovation

LA-F-31-9/11-19 page 11/14



Reference No. : 0303/17008

### Scope of Testing Laboratory Accreditation

Laboratory Name : Laboratory of Water Analysis Center Co., Ltd.

Address : 1/94 Moo 5, Tambon Kanharm, Amphoe U-Thai,  
Changwat Phra Nakhon Si Ayutthaya 13210

Accreditation Number : Testing - 0029

Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
3 (cont.)	Wastewater	- COD 40 mg/L to 3 000 mg/L  - Total Kjeldahl Nitrogen 5 mg/L to 200 mg/L  - Oil and grease 2 mg/L to 1 000 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 5220 C  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 4500-NH <sub>3</sub> C, 4500-N <sub>org</sub> B  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 5520 D

Initial Issue Date 23<sup>rd</sup> September 2008

Issue Number 13

Bureau of Laboratory Accreditation, Department of Science Service, Ministry of Higher Education, Science, Research and Innovation

LA-F-31-9/11-19

page 12/14

Reference No. : 0303/17008

### Scope of Testing Laboratory Accreditation

Laboratory Name : Laboratory of Water Analysis Center Co., Ltd.

Address : 1/94 Moo 5, Tambon Kanharm, Amphoe U-Thai,  
Changwat Phra Nakhon Si Ayutthaya 13210

Accreditation Number : Testing - 0029

Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
3 (cont.)	Wastewater	- Total solids dried at 103 °C to 105 °C 25 mg/L to 4 000 mg/L  - Selenium 5 µg/L to 50 µg/L  - Arsenic 5 µg/L to 50 µg/L  - Barium 0.5 mg/L to 5 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 2540 B  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 3114 C  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23 <sup>rd</sup> ed., 2017, part 3111 D, 3030 E

Initial Issue Date 23<sup>rd</sup> September 2008

Issue Number 13

Bureau of Laboratory Accreditation, Department of Science Service, Ministry of Higher Education, Science, Research and Innovation

LA-F-31-9/11-19

page 13/14

Reference No. : 0303/17008

### Scope of Testing Laboratory Accreditation

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Address : 1/94 Moo 5, Tambon Kanharm, Amphoe U-Thai,

Changwat Phra Nakhon Si Ayutthaya 13210

Accreditation Number : Testing - 0029

Laboratory Status : ☐ Permanent ☒ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
4	Environmental noise	- Sound level Equivalent sound level $L_{eq,T}$ 30 dB (A) to 120 dB (A) Maximum sound level $L_{max}$ 30 dB (A) to 120 dB (A)	In - house method : TM 201 based on ISO 1996-2 : 2017

Issue Date : 7<sup>th</sup> November 2022

Signature : 


(Mrs. Pochaman Tagheen)

Director of Bureau of Laboratory Accreditation

Initial Issue Date 23<sup>rd</sup> September 2008



Issue Number 13

Bureau of Laboratory Accreditation, Department of Science Service, Ministry of Higher Education, Science, Research and Innovation



**THC**  
Calibration Services

**THAI HEART CALIBRATION CO., LTD.**  
112/11 Moo 5, Phraet St., Muang Samut Prakan 10230  
Tel: 0-2394-2462, 0-2357-8458, 0-2757-8496 Fax: 0-2757-8507

## CERTIFICATE OF CALIBRATION

**Certificate No.:** C0-1808005/23

**Page** 1 **of total** 4 **pages**

**Customer** WATER ANALYSIS CENTER CO., LTD.  
1/94 Moo 5, T.Kanham,  
A.U-thai, Ayutthaya 13210

<b>Equipment</b>	pH Meter	<b>Model</b>	SevenCompact S220
<b>Manufacturer</b>	METTLER TOLEDO	<b>ID No.</b>	WWL 0068
<b>Serial No.</b>	B327527211		
<b>Description</b>	Range : 0 - 14 pH, Resolution : 0.01 pH		

**Environmental Conditions**

Ambient Temperature:	(20 ± 2) °C
Relative Humidity:	(50 ± 10) %
Atmospheric Pressure:	-

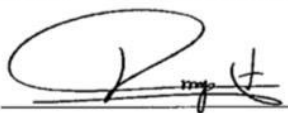
**Calibration Location** Jayhawks Laboratory (CL&GL)


**Received Date** 18 August 2023

**Calibration Date** 18 August 2023

**Date of Issue** 21 August 2023

**Condition of Artifacts** Used conditions but can be calibrated

  
**Checked by**  
 Act as Technical Manager

  
**Approved by**  
 Representative of Managing Director  
 ( Dr. Ekachai Puttitwong )

( ) ( Krisyosi K. )	( ) ( Sakda Y. )
( ) ( Patiphan K. )	( ✓ ) ( Onnapa P. )
( ) ( Pongsak H. )	( ) ( Nitiphong K. )
( ) ( Kanung C. )	( ) ( Nonthachai K. )
( ) ( Pramong P. )	( ) ( Noppol P. )

This calibration certificate shall not be reproduced other than in full except with the prior written approval of the Thai Heart Calibration Co., Ltd.

FE-169 REV.02 02/24/21



**THAI HEART CALIBRATION CO., LTD.**  
 112/1 Moo 5, Phetch Sila Road, Samut Prakan 10230  
 Tel. 0-2391-2162, 0-2757-8455, 0-2757-8496 Fax. 0-2757-8407



Certificate No.: C0-1808005/23

Page 2 of total 4 pages

Reference Method:

- The calibration method used was CP-178 based on an in-house method.
- This certificate can be traceable to the national standards, which is realized the shown measurement units according to the International System of Units (SI Units).

Reference Standard:

Type	pH Value	Lot No.	Due Date	Traceability
pH Standard Solution	4.01	030822	Feb. 9, 2024	NIMT
	7.01	300522	Feb. 9, 2024	
	10.01	230822	Feb. 7, 2024	

Type	Model	Serial No.	Certificate No.	Due Date	Traceability
Documenting Process Calibrator	754	2630521	I0-2412001/22	Dec. 23, 2023	THC
Digital Thermometer with Sensor	1523 / 5622	1709138 / 4605984-005	I0-0806001/23	Jun. 8, 2024	

Remark: This certificate is traceable to the International System of Unit (SI Unit) through:

- NIMT, National Institute of Metrology (Thailand).
- THC, Thai Heart Calibration Co., Ltd.

Measurement Results:

1. Function Simulated pH Meter

Standard Applied ( mV )	Nominal Value ( pH )	UUC Reading		Uncertainty ( ± mV )
		pH	mV	
177.48	4.00	4.01	177.4	0.060
0.00	7.00	7.00	0.0	0.060
-177.48	10.00	10.01	-177.4	0.060


UUC : Unit Under Calibration

Note : Adjust Curve to simulate pH (4,7,10)

FE-169



Calibrated by Kittipong  
 REV.02 02/24/21





**THC**  
Calibration Services

**THAI HEART CALIBRATION CO., LTD.**  
112/11 Moo 5, Phraet Sai, Muang Samut Prakan, 10280  
Tel: 0-2894-2162, 0-2757-8507, 0-2757-8507

---

**Certificate No.:** C0-1808005/23

**Page 3 of total 4 pages**

**Measurement Results (Cont.):**

**2. Calibration of pH Electrode (Serial No.: 3222623)**

pH Standard Solution ( pH )	Measured Value		Uncertainty ( ± pH )
	( pH )	( mV )	
4.01	4.01	180.0	0.013
7.01	7.00	4.0	0.013
10.01	10.01	-172.0	0.013

**Note :** Adjust Curve to Buffer Solution pH (4,7,10)  
Temperature stability of micro bath :  $25 \pm 0.2^{\circ}\text{C}$


The above reported uncertainty of measurement is the expanded uncertainty obtained by multiplying the standard uncertainty with the coverage factor  $k = 2.00$ , providing a level of confidence approximately 95%.

FE-169

Calibrated by Kittipong



REV.02 02/24/21





**THC**  
Calibration Services

**THAI HEART CALIBRATION CO., LTD**  
112/1 Moo 5, Phraek Sa, Muang, Samut Prakan 10280  
Tel. 0-23942162-0-27573455-0-27573496 Fax. 0-275748807

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**Certificate No.:** C0-1808005/23

**Page 4 of total 4 pages**

**Reference Method:**

- The calibration method used was CP-096 based on an in-house method.
- The temperature scale used was an ITS-90.
- This certificate can be traceable to the national standards, which is realized the shown measurement units according to the International System of Units (SI Units).

**Reference Standard Instruments:**

Type	Model	Serial No.	Cert. No.	Due Date	Traceability
Thermometer Readout	1529-R	B7C853	I0-0911001/22	Nov. 9, 2023	THC
Platinum Resistance Thermometer	5626	4854	C0A30047	Oct. 22, 2023	FLUKE
Liquid Bath	XORTS-40A	XO111019	I0-2405001/23	May 25, 2025	THC

**Remark:** This certificate is traceable to the International System of Unit (SI Unit) through:

- THC, Thai Heart Calibration Co., Ltd.
- FLUKE, Fluke Comporation, U.S.A.

**Measurement Results:** ( X ) Without Adjustment

Dimension of probe : Diameter 4 mm. Sensor Type : RTD (PT100)


Immersion Depth (mm.)	Standard Reading (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (± °C)
120	22.00	22.2	-0.20	0.065
120	25.00	25.2	-0.20	0.065
120	28.00	28.2	-0.20	0.065

UUC : Unit Under Calibration

The above reported uncertainty of measurement is the expanded uncertainty obtained by multiplying the standard uncertainty with the coverage factor  $k = 2.00$ , providing a level of confidence approximately 95%.

- End of Certificate -

FE-169

Calibrated by Pongsak  
REV.02 02/24/21



## Master Calibration Co., Ltd.

547 Soi Ratchadaniwat, Kwaeng Samsennok, Khet Huaykwang, Bangkok 10310

Tel. : (02) 274 2978-9, (02) 2742987-8 Fax : (02) 274 2518, (02) 274 2989

Website : www.mastercalibration.com E-mail : calibrate@mastercalibration.com

# Certificate of Calibration

## TEMPERATURE CONTROLLER ENCLOSURES



Certificate No.: MC 2307702

Page 1 of 3



Customer : Water Analysis Center Co., Ltd.  
1/94 Moo 5, T.Kantham, A.U-Thai, Ayutthaya 13210.

Reference Job No. : 23-1577 Received Date : 11 July 2023

Description : Refrigerator

Manufacturer : SANDEN INTERCOOL Model : SEC-1500SBD

Serial No. : SEC1500201A-0708-00304 ID. No. : WWL0038

Marking : Additionally for the purpose of identification by this laboratory a label marked with this certificate number ( MC 2307702 ) has been attached to the case.

Method : In-House calibration procedure MWI-T-033 this method is reference to TLAS G-20 "Temperature Controlled Enclosures".

Location of Calibration : Water Analysis Center Co., Ltd. ; Laboratory.

Environmental Conditions : Ambient Temperature : ( 25.3 to 25.9 ) °C  
Relative Humidity : ( 65.2 to 67.9 ) %

Date of Calibration : 11 July 2023 Date of Issue : 12 July 2023

Checked by : Thanagorn  
Thanagorn Limchaicharoen  
(Calibration Supervisor)

Approved by : Aittipong  
Aittipong Kanjanawasit  
( Technical Manager )

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

This certificate is issued in accordance with the conditions of accreditation granted by the National Standardization Council of Thailand-Office of the National Standardization Council that has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of Master Calibration Co.,Ltd.

[MCF-Q-077 ; Rev.6 ; Date : 22/04/2021]



547 Soi Ratchadanivat, Kwaeng Samsenok, Khet Huaykwang, Bangkok 10310

Tel. : (02) 274 2978-9, (02) 2742987-8 Fax : (02) 274 2518, (02) 274 2989

Website : www.mastercalibration.com E-mail : calibrate@mastercalibration.com

Certificate No.: MC 2307702

Page 2 of 3

#### The Reference Standard Instrument :

Description	Certificate No.	Serial No.	Due date	Traceable thru
Data Acquisition/Switch Unit With Thermocouple Type " T " ID. No.17/1 to 17/9	MC 2303173	MY41010916	9 Mar 2024	MCAL

#### Traceability :

The measurement standard traceable to the international system of units (SI) through certificate as mentioned above

#### 1. Calibration Procedure:

This Instrument was calibration according to TLAS G-20 by comparison with calibrated thermocouple type T under no load condition. The Thermocouples were placed on nine points and located one thermocouple in each of the eight corners of the chamber and was away from the each wall of 5 cm to 10 cm. And placed the ninth thermocouple within 2.5 cm of the geometric center of the chamber.

*Temperature Uniformity* - the maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady state conditions. The reference sensor should preferably be located at the geometric center of the chamber.

*Temperature Stability* - one-half of the greatest maximum difference of measured temperatures at any one sensor.

*Overall Variation* - The Difference of the maximum and minimum measured temperatures throughout observation.

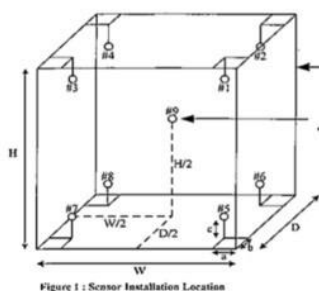


Figure 1 : Sensor Installation Location

Overall Ambient Temperature around the Chamber variation : 3.2 °C

Overall Line Voltage variation : 0.1 V

Chamber Size (W\*H\*D) : 171 cm x 157 cm x 60 cm

Checked by : *Thanagim*

[MCF-Q-077 ; Rev.6 ; Date : 22/04/2021]



547 Soi Ratchadaniwat, Kwaeng Samsenok, Khet Huaykwang, Bangkok 10310  
Tel. : (02) 274 2978-9, (02) 2742987-8 Fax : (02) 274 2518, (02) 274 2989  
Website : www.mastercalibration.com E-mail : calibrate@mastercalibration.com

Certificate No.: MC 2307702

Page 3 of 3

## 2. Result of calibration :

### Temperature Measurement Accuracy Test

Indicating Temperature (°C)	Measured Temperature (°C) at Spread Locations									Uncertainty (±°C)
	#1	#2	#3	#4	#5	#6	#7	#8	Ref. #9	
2.5	4.4	4.2	4.2	4.2	4.0	3.9	4.1	4.0	3.8	0.86

### Chamber Characterization Result

Controller Temperature (°C)	Indicating Temperature (°C)	Temperature Stability (±°C)	Temperature Uniformity (°C)	Overall Variation (°C)
2.0	2.5	1.50	1.01	3.3

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a level of confidence of approximately 95 %.


This certificate will certify of the calibrated equipment only.

End of Certificate

Checked by : *Thanagorn*



[MCF-Q-077 ; Rev.6 ; Date : 22/04/2021]



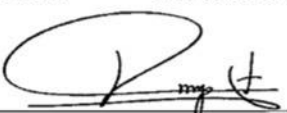



**THC**  
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**THAI HEART CALIBRATION CO., LTD.**  
112/1 Moo 5, Pineda St. Muang Samut Prakan 10280  
Tel: 0-2394-2162, 0-2757-3456, 0-2757-8495, 0-2757-8507


## CERTIFICATE OF CALIBRATION

Certificate No.:	C0-1907007/23	Page	1	of total	2	pages
Customer	WATER ANALYSIS CENTER CO., LTD. 1/94 Moo 5, T.Kanham, A.U-thai, Ayutthaya 13210					
Equipment	Conductivity Meter					
Manufacturer	EUTECH	Model	CON 2700			
Serial No.	2657889	ID No.	WWL 0136			
Description	-					
Environmental Conditions	Ambient Temperature: (20 ± 2) °C Relative Humidity: (50 ± 10) % Atmospheric Pressure: -					
Calibration Location	Jayhawks Laboratory (CL&GL)					
Received Date	19 July 2023					
Calibration Date	19 July 2023					
Date of Issue	20 July 2023					
Condition of Artifacts	Used conditions but can be calibrated					
Checked by	 Act as Technical Manager		 Representative of Managing Director			
	<input type="checkbox"/> ( Krisyosl K. ) <input type="checkbox"/> ( Sakda Y. )		( Dr. Ekachai Puttitwong )			
	<input type="checkbox"/> ( Patiphan K. ) <input checked="" type="checkbox"/> ( Onnapa P. )					
	<input type="checkbox"/> ( Pongsak H. ) <input type="checkbox"/> ( Nitiphong K. )					
	<input type="checkbox"/> ( Kanung C. ) <input type="checkbox"/> ( Nonthachai K. )					
	<input type="checkbox"/> ( Pramong P. ) <input type="checkbox"/> ( Noppol P. )					

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FE-169

REV.02 02/24/21



**THC**  
Calibration Services

**THE HEART CALIBRATION CO., LTD.**  
112/1 Moo 5, Phad Sa Muang, Samut Prakan 10230  
Tel. 0-2394-2162, 0-2757-3455, 0-2757-3195 Fax. 0-2757-4507



**ILAC-MRA**  
**ANAB**  
ACCREDITED  
ISO/IEC 17025  
CALIBRATION LABORATORY  
AC-2695

**Certificate No.:** C0-1907007/23 **Page 2 of total 2 pages**

**Reference Method:**

- The calibration method used was CP-177 based on an in-house method.
- This certificate can be traceable to the national standards, which is realized the shown measurement units according to the International System of Units (SI Units).

**Reference Standard :**

Material	Batch Value	Lot Number	Due Date	Traceability
Conductivity Standard Solution	147.8 $\mu$ S/cm	S220611005	Dec. 6, 2023	SCP Science
	1.425 mS/cm	S220812006	May 31, 2024	

**Remark:** This certificate is traceable to the International System of Unit (SI Unit) through:

- SCP Science.

**Measurement Results: (Probe Serial No. : 93X219065)**

Conductivity Standard Solution	Measured Value	Correction	Uncertainty ( $\pm$ )
147.8 $\mu$ S/cm	147.5 $\mu$ S/cm	0.3 $\mu$ S/cm	2.5 $\mu$ S/cm
1.425 mS/cm	1.427 mS/cm	-0.002 mS/cm	0.0051 mS/cm

**Note :** Adjustment points: 147.8 $\mu$ S/cm 1.425mS/cm

The above reported uncertainty of measurement is the expanded uncertainty obtained by multiplying the standard uncertainty with the coverage factor  $k = 2.00$ , providing a level of confidence approximately 95%.


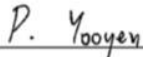
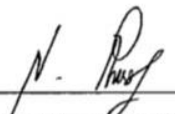
- End of Certificate -


FE-169

Calibrated by Onnapa

REV.02 02/24/21



	<b>AUTOMATION SERVICE CO.,LTD.</b> <b>CALIBRATION LABORATORY</b>
SV 201005/2024	Cert. No. WAC-065 Page 1 of 2
<b>CERTIFICATE OF CALIBRATION</b>	
Instrument : DO Meter	Machine : -
Model : DO-31P	Location : -
Serial No. : 780065	
Manufacturer : TOA-DKK	
Measuring Range : 0.00 ~ 20.00 mg/l	
Customer : Water Analysis Center Co.,Ltd. 1/94 Moo.5 T.Kanham, A.U-Thai Ayutthaya 13210 Thailand	
Date Of Received : 11 / 01 / 2024	
Date Of Calibration : 11 / 01 / 2024	
Ambient Condition : Temperature 26 °C Humidity 58 % RH	
Calibrated By : 	
( Ms. Phanee Yooyen ) Technician	
Approved By : 	
( Mr. Nipon Phungsomsak ) Technical Manager	
Date Of Issue : 15 / 01 / 2024	
This Certificate may not be reproduced other than in full, except with the prior written approval of the head of the industrial instruments calibration center.	
Automation Service Co.,Ltd. 929,929/1 Soi Pattanakarn30, Pattanakarn Rd., Suanluang, Suanluang, Bangkok 10250 Tel. : 02-319-9994 ext. 721,725   E-mail : iso@automation.co.th, serviceia@automation.co.th   www.automation.co.th	



**AUTOMATION SERVICE CO.,LTD.**  
**CALIBRATION LABORATORY**

Instrument : DO Meter

Model : DO-31P

Serial No. : 780065

Cert. No. WAC-065

Page 2 of 2

Calibrate Procedure

☐ This instrument was calibrated by comparison with standard solution (PH/ORP)

☐ This instrument was calibrated by comparison with scattering plate value (Turbidity)

☐ This instrument was calibrated by comparison with conductivity (Conductivity)

☒ This instrument was calibrated by comparison with Sodium sulfite anhydrous (DO)

Condition of this result of calibration

1). Reference Standard Solution

Standard	Lot No	Batch.	Cert. No.	Due Date
Sodium Sulfite Power	408K1405	-	-	-

2). Traceability This certification is traceable to

☒ Kanto Chemical Co.,INC.

☐ DKK Corporation

Result Of Calibration

Standard Solution (mg/l) at 25.7°C		Before Adjust		After Adjust	
		Indicator	Error	Indicator	Error
Zero	0.00	0.10	+ 0.10	0.00	-
Span	8.02	6.45	- 1.57	8.02	-

DO Electrode No. OE270AA(5) S/N 111F0029

Calibrated By P. Yooyen

( Ms. Phanee Yooyen )  
Technician

Automation Service Co.,Ltd. 929,929/1 Soi Pattanakarn30, Pattanakarn Rd., Suanluang, Suanluang, Bangkok 10250  
 Tel : 02-319-9994 ext. 721.725 ! E-mail : iso@automation.co.th, serviceia@automation.co.th | www.automation.co.th



**Inctech Metrological Center Co.Ltd.**  
39/1 Soi 82, Sukhapiban 5 Rd., O ngoen,  
Saimai, Bangkok 10220, Thailand  
Tel. (662) 909-8820 (Auto 10 lines) www.imcinstrument.com



Calibration Cert. # 3884.01  
ISO/IEC 17025

## Certificate of Calibration

Certificate No. : MT24-3208

Page : 1 of 2

**Customer** : Water Analysis Center Co.,Ltd.

**Address** : 1/94 M.5, Rojana Industrial Park, T.Kanham, A.U-Thai, Ayutthaya 13210

**Description** : Hot Air Oven

**Manufacturer** : Memmert

**Model** : UF 260

**Serial No.** : B620.0814

**Identification No.** : WWL 0212

**Calibration Place** : Customer Laboratory

**Order No.** : 1152/24

**Received date** : Mar 22, 2024

**Calibration date** : Mar 22, 2024

**Environment Condition :**

**Temperature** : ( 25+/-10 ) °C

**Humidity** : ( 50+/-30 ) %RH

**Calibration Method** : Calibration were conducted using In-house calibration procedure CP-MT-006 According to comparison with LXI Data Acquisition Switch Unit with sensor. The calibration methods based on Euramet Calibration Guide No.20 - guidelines on the Calibration of Temperature and/or Humidity Controlled Enclosures.

### Reference Standard Instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due Date</u>
LXI Data Acquisition Switch Unit with Sensor	34972A	MY49020096	MT23-7163	Nov 30, 2024

The effect that the result relate only to the items calibrated. It was found accurate as shown on date and place of calibration only.

**Traceability** : This measurement are traceable to the International System of Unit (SI), through National Institute of Metrology Thailand ( NIMT )

The reported expanded uncertainty of measurement was based on standard uncertainty multiplied by coverage factor of 2, providing a level of confidence of not less than 95%



**Calibrated by :** Mr.Yuttakorn Jamneansri

**Approved by :**

( Mr.Panuwat Phuklan )

**Issue date :** Apr 10, 2024

This calibration certificate shall not be reproduced other than in full except with the prior written approval of Inctech Metrological Center Co.,Ltd

Rev.03 / Feb 2024

FM-MT-013



**Inctech Metrological Center Co.Ltd.**

39/1 Soi 82, Sukhapiban 5 Rd., O ngoen,

Saimai, Bangkok 10220, Thailand

Tel. (662) 909-8820 (Auto 10 lines) www.imcinstrument.com



Calibration Cert. # 3884.01  
ISO/IEC 17025

Certificate No. : MT24-3208

Page : 2 of 2

Function : Temperature measurement

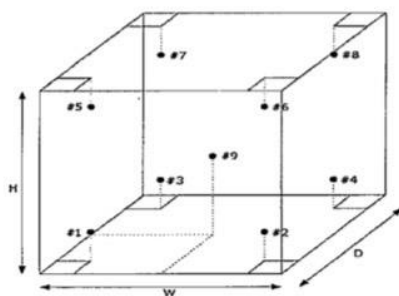
Result : Without adjustment

Calibration point : 104, 180 °C

Resolution : 0.1 °C

Calibration point (°C)	Temperature of UUC* at each position (°C)									Uncertainty of measurement (+/- °C)
	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	Ch.6	Ch.7	Ch.8	Ch.9	
104	103.494	103.933	103.871	103.988	103.990	104.081	103.843	104.217	104.022	0.45
180	179.985	179.953	180.047	179.985	179.908	180.088	180.065	180.273	180.105	0.54

Setting temperature (°C)	Indicating Temperature (°C)	Measured stability (+/- °C)	Measured uniformity (°C)	Overall variation (°C)
104.0	104.0	0.34	0.66	1.3
180.0	180.0	0.41	0.86	1.2



- #1 Lower Left Front
- #2 Lower Right Front
- #3 Lower Left Rear
- #4 Lower Right Rear
- #5 Upper Left Front
- #6 Upper Right Front
- #7 Upper Left Rear
- #8 Upper Right Rear
- #9 Geometric Center

Front view

UUC\* = Unit under calibration

**Uniformity** = Maximum and Minimum difference of measured temperature at any probes and the measured temperature at the reference and same time.


**Overall Variation** = Difference of temperature value between the maximum and minimum any time.



**Stability** = One half of the maximum difference of measured temperatures at any one probe.

-oOo-

Rev.03 / Feb 2024

FM-MT-013



NSC-TISI-TIS 17025  
Calibration 0087

## Certificate of Calibration

<b>Equipment:</b>	Balance	<b>Certificate No.:</b> C01241754
<b>Model:</b>	BL 210S	<b>Issued Date:</b> 05 June 2024
<b>Serial No. (or ID.):</b>	15808131 (WWL 0022)	<b>Job No.:</b> WO-00030302
<b>Manufacturer:</b>	Sartorius	<b>Page:</b> 1 of 2
<b>Condition:</b>	In condition	

**Customer:** Water Analysis Center Co., Ltd.  
1/94 Moo 5, Rojana Industrial Park, Rojana Road,  
Tambol Kanham, Amphur U-Thai, Ayutthaya 13210 Thailand

**Environment Condition:** Temperature 26 °C ± 0.2 °C  
Humidity 50 %RH ± 2.6 %RH


**Calibration Place:** Water Analysis Center Co., Ltd. ( ห้องเครื่องชั่ง )  
1/94 Moo 5, Rojana Industrial Park, Rojana Road,  
Tambol Kanham, Amphur U-Thai, Ayutthaya 13210 Thailand

**Calibration By:** Mr. Polawad Ruamrup


**Calibration Date:** 05 June 2024

**The Method used:** In-house method, CAL-WI-47, based on UKAS Lab 14

**Traceability:** This certificate is traceable to the SI Units maintained by National Institute of Metrology (NIMT), Thailand through DKSH Technology Co., Ltd. Certificate No. C02240400



(Mr. Polawad Ruamrup)  
Person in charge



(Mr. Rungrod Jenkitrakulchai)  
Authorized signatory

This certificate is issued the units of measurement according to the International System of Units (SI). It provides traceability of measurement to international or national standard or other recognized national standard laboratories.  
The measurement uncertainty stated is the expanded uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor (k=2) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM).  
These results may be affected by deviations from specified conditions. The results relate only to the items tested, calibrated or sampled. The report shall not be reproduced except in full without approval of DKSH Technology Limited.

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DKSH Technology Limited  
2533 ถนนสุโขทัย แขวงบางจาก เขตพระโขนง กรุงเทพมหานคร 10260  
2533 Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260  
Phone: +66 2638 7000 Email: info.calibration@dksh.com Website: www.dksh.com/scientific-thailand

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CAL-FM-C01-14: 12 Sep 2022








Certificate No.: C01241754

Page: 2 of 2

### Calibration Results:

#### Without Adjustment

Eccentric Error: Weight to be 1/3 or 1/2 of Maximum capacity, taken from the center of the pan as a zero reference.

			Nominal Test Value	100	(g)
Reference Points (g)					
A	B	C	D	E	
-	0.0000	0.0001	0.0000	-0.0002	

Repeatability: Determination of the standard deviation of weighing balance., Readability 0.0001 (g)

Nominal test value (g)	Standard Deviation
20	0.00004
200	0.00006

Error of indication from nominal or conventional mass value., Readability 0.0001 (g)

Nominal Value (g)	Conventional Mass (g)	Displayed Value (g)	Error of indication (g)	Uncertainty (g)	k
1	1.00001	1.0000	0.0000	0.00011	2.04
2	2.00002	2.0000	0.0000	0.00011	2.04
5	5.00002	5.0000	0.0000	0.00011	2.04
10	10.00001	10.0000	0.0000	0.00011	2.04
20	20.00001	20.0000	0.0000	0.00012	2.03
50	50.00003	50.0000	0.0000	0.00013	2.02
70	70.00004	70.0000	0.0000	0.00016	2.01
100	99.99996	100.0001	0.0001	0.00017	2.01
120	119.99997	120.0002	0.0002	0.00021	2.00
150	149.99999	150.0002	0.0002	0.00024	2.00
200	199.99996	200.0004	0.0004	0.00030	2.00

The End of Certificate

บริษัท ดีเคเอสเอช เทคโนโลยี จำกัด  
DKSH Technology Limited  
2533 ถนนสุขุมวิท แขวงบางจาก เขตพระโขนง กรุงเทพมหานคร 10260  
2533 Sukhumvit Road, Bangchak, Phraekhanong, Bangkok 10260  
Phone: +66 2639 7000 Email: info.calibration@dksh.com Website: www.dksh.com/scientific-thailand

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CAL-FM-C01-14: 12 Sep 2022





## Master Calibration Co., Ltd.

547 Soi Ratchadaniwat, Kwaeng Samsennok, Khet Huaykwang, Bangkok 10310

Tel. : (02) 274 2978-9, (02) 2742987-8 Fax : (02) 274 2518, (02) 274 2989

Website : www.mastercalibration.com E-mail : calibrate@mastercalibration.com

### Certificate of Calibration

#### LIQUID BATH



Certificate No.: MC 2314268

Page 1 of 3



Customer : Water Analysis Center Co., Ltd.  
1/94 Moo 5, T.Kantham, A.U.-Thai, Ayutthaya 13210.

Reference Job No. : 23-2833      Received Date : 15 December 2023

Description : Water Bath

Manufacturer : ESSTELL      Model : EWB-122D

Serial No. : 20180508122      ID. No. : WWL 0214

Marking : Additionally for the purpose of identification by this laboratory a label marked with this certificate number ( MC 2314268 ) has been attached to the case.

Method : In-House calibration procedure MWI-T-029 this method is reference to ASTM E715 "Liquid Bath".

Location of Calibration : Water Analysis Center Co., Ltd. ; Laboratory.

Environmental Condition : Ambient Temperature : ( 29.4 to 29.8 ) °C  
Relative Humidity : ( 49.0 to 52.0 ) %

Date of Calibration : 15 December 2023      Date of Issue : 19 December 2023

Checked by : Chalermkit  
Chalermkit Rakphada  
( Calibration Engineer )

Approved by : Aittipong  
Aittipong Karjanasit  
( Technical Manager )

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

This certificate is issued in accordance with the conditions of accreditation granted by the National Standardization Council of Thailand-Office of the National Standardization Council that has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of Master Calibration Co., Ltd.

[MCF-Q-077 ; Rev.6 ; Date : 22/04/2021]



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Website : www.mastercalibration.com E-mail : calibrate@mastercalibration.com

Certificate No.: MC 2314268

Page 2 of 3

**Reference Standard Instrument :**

Description	Certificate No.	Serial No.	Due date	Traceable thru
Data Acquisition/Switch Unit With Thermocouple Type " T " ID. No.27/1 to 27/5	MC 2301270	MY44020009	9 Mar 2024	MCAL

**Traceability :**

The measurement standard traceable to the international system of units (SI) through certificate as mentioned above

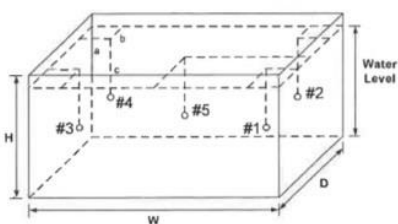
**1. Calibration Procedure:**

This Instrument was calibration according to ASTM E715 - 2007 by comparison with calibrated sensor under no load condition. The sensor were placed on five points and located one sensor in each of the eigh corners of the chamber and was away from the each wall of 5 cm to 10 cm. And placed the five sensor within 2.5 cm of the geometric center of the chamber.

*Temperature Uniformity* - the maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady state conditions. The reference sensor should preferably be located at the geometric center of the chamber.

*Temperature Stability* - one-half of the greatest maximum difference of measured temperatures at any one sensor.

*Overall Variation* - The Difference of the maximum and minnum measured temperatures throughout observation.



- Overall Ambient Temperature around the Chamber variation : 1.3 °C
- Overall Line Voltage variation : 0.0 V
- Chamber Size (W\*H\*D): 50 cm x 12 cm x 30 cm
- Water Level : 7 cm

Checked by : Chalemkul

[MCF-Q-077 ; Rev.6 ; Date : 22/04/2021]



547 Soi Ratchadanivat, Kwaeng Samsennok, Khet Huaykwang, Bangkok 10310  
Tel. : (02) 274 2978-9, (02) 2742987-8 Fax : (02) 274 2518, (02) 274 2989  
Website : www.mastercalibration.com E-mail : calibrate@mastercalibration.com

Certificate No.: MC 2314268

Page 3 of 3

## 2. Result of calibration :

### Temperature Measurement Accuracy Test

Indicating Temperature (°C)	Measured Temperature (°C) at Spread Locations					Uncertainty (±°C)
	#1	#2	#3	#4	Ref. #5	
45.0	44.5	44.4	44.5	44.5	44.6	0.45

### Chamber Characterization Result

Desired Temperature (°C)	Controller Temperature (°C)	Indicating Temperature (°C)	Temperature Stability (±°C)	Temperature Uniformity (°C)	Overall Variation (°C)
44.5	45.0	45.0	0.62	0.88	1.5

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2.0$ , providing a level of confidence of approximately 95 %.

**This certificate will certify of the calibrated equipment only.**

**End of Certificate**

Checked by : *Chalermsak*

[MCF-Q-077 ; Rev.6 ; Date : 22/04/2021]





**Master Calibration Co.,Ltd.**  
547 Soi Ratchadanivat, Kwaeng Samsennok, Khet Huaykwang, Bangkok 10310  
Tel : (02) 274 2978-9, (02) 2742987-8 Fax : (02) 274 2518, (02) 274 2989  
Website : www.mastercalibration.com E-mail : calibrate@mastercalibration.com

**Certificate of Calibration**

**TEMPERATURE  
CONTROLLER ENCLOSURES**



NSC-TISI-TIS 17025  
CALIBRATION 0183

**Certificate No.: MC 2314270**

Customer : Water Analysis Center Co., Ltd.  
1/94 Moo 5, T.Kantham, A.U-Thai, Ayutthaya 13210.

Reference Job No. : 23-2833 Received Date : 15 December 2023  
Description : Incubator  
Manufacturer : Memmert Model : IN260  
Serial No. : D619.0170 ID. No. : WWL 0192  
Marking : Additionally for the purpose of identification by this laboratory a label marked  
with this certificate number ( MC 2314270 ) has been attached to the case.  
Method : In-House calibration procedure MWI-T-033 this method is reference to  
TLAS G-20 "Temperature Controlled Enclosures".  
Location of Calibration : Water Analysis Center Co., Ltd. ; Laboratory.  
Environmental Conditions : Ambient Temperature : ( 25.2 to 25.6 ) °C  
Relative Humidity : ( 65.4 to 66.2 ) %  
Date of Calibration : 15 December 2023 Date of Issue : 19 December 2023

Checked by : Chalermkit  
Chalermkit Rakphada  
( Calibration Engineer )

Approved by : Aittipong  
Aittipong Kahjansawasit  
( Technical Manager )

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

This certificate is issued in accordance with the conditions of accreditation granted by the National Standardization Council of Thailand-Office of the National Standardization Council that has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of Master Calibration Co.,Ltd.

[MCF-Q-077 ; Rev.6 ; Date : 22/04/2021]

Page 1 of 3

จัดทำโดย นิติบุคคลอาคารชุด บี คอนโด

240 | 266



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Tel. : (02) 274 2978-9, (02) 2742987-8 Fax : (02) 274 2518, (02) 274 2989  
Website : www.mastercalibration.com E-mail : calibrate@mastercalibration.com

Certificate No.: MC 2314270

Page 2 of 3

#### Reference Standard Instrument :

Description	Certificate No.	Serial No.	Due date	Traceable thru
Data Acquisition/Switch Unit	MC 2214032	MY41029992	26 Dec 2023	MCAL
With Thermocouple Type " T " ID. No.31/1 to 31/9				

#### Traceability :

The measurement standard traceable to the international system of units (SI) through certificate as mentioned above

#### I. Calibration Procedure:

This Instrument was calibration according to TLAS G-20 by comparison with calibrated thermocouple type T under no load condition. The Thermocouples were placed on nine points and located one thermocouple in each of the eigh corners of the chamber and was away from the each wall of 5 cm to 10 cm. And placed the ninth thermocouple within 2.5 cm of the geometric center of the chamber.

*Temperature Uniformity* - the maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady state conditions. The reference sensor should preferably be located at the geometric center of the chamber.

*Temperature Stability* - one-half of the greatest maximum difference of measured temperatures at any one sensor.

*Overall Variation* - The Difference of the maximum and minimum measured temperatures throughout observation.

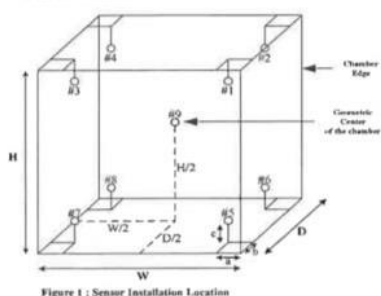


Figure 1 : Sensor Installation Location


Overall Ambient Temperature around the Chamber variation : 0.4 °C

Overall Line Voltage variation : 0.0 V

Chamber Size (W\*H\*D) : 65 cm x 80 cm x 50 cm

Checked by : Chalermkit

[MCF-Q-077 ; Rev.6 ; Date : 22/04/2021]



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MASTER CALIBRATION CO.,LTD.

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Website : www.mastercalibration.com E-mail : calibrate@mastercalibration.com

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**Certificate No.: MC 2314270**

Page 3 of 3

**2. Result of calibration :**

**Temperature Measurement Accuracy Test**

Indicating Temperature (°C)	Measured Temperature (°C) at Spread Locations									Uncertainty (±°C)
	#1	#2	#3	#4	#5	#6	#7	#8	Ref. #9	
35.0	35.2	35.2	35.2	35.2	35.1	35.1	35.0	35.1	35.1	0.44

**Chamber Characterization Result**

Desired Temperature (°C)	Controller Temperature (°C)	Indicating Temperature (°C)	Temperature Stability (±°C)	Temperature Uniformity (°C)	Overall Variation (°C)
35.0	35.0	35.0	0.13	0.21	0.4

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a level of confidence of approximately 95 %.

**This certificate will certify of the calibrated equipment only.**

**End of Certificate**

Checked by : *Chalemkrit*

[MCF-Q-077 ; Rev.6 ; Date : 22/04/2021]