

## Scope of Accreditation for Testing

Certificate No. 21T061/1274

Laboratory name     Testing Laboratory  
 Linde (Thailand) Public Company Limited  
 Address                269 Sukhumvit Road, Map Ta Phut, Mueang Rayong, Rayong  
 Accreditation No.    TESTING 0659  
 Laboratory status     Permanent    Site    Temporary    Mobile

Field of Testing	Parameter	Test Method
Petrochemicals field  1. Liquid carbon dioxide	<ul style="list-style-type: none"> <li>- Methane 0.4 ppm to 25.0 ppm v/v (0.4 ppm mole to 25.0 ppm mole)</li> <li>- Ethane 0.4 ppm to 25.0 ppm v/v (0.4 ppm mole to 25.2 ppm mole)</li> <li>- Ethylene 0.4 ppm to 25.0 ppm v/v (0.4 ppm mole to 25.1 ppm mole)</li> <li>- Propane 0.4 ppm to 25.0 ppm v/v (0.4 ppm mole to 25.4 ppm mole)</li> <li>- Propylene 0.4 ppm to 25.0 ppm v/v (0.4 ppm mole to 25.4 ppm mole)</li> <li>- Isobutane 0.4 ppm to 25.0 ppm v/v (0.4 ppm mole to 25.8 ppm mole)</li> <li>- Normal butane 0.4 ppm to 25.0 ppm v/v (0.4 ppm mole to 25.8 ppm mole)</li> <li>- Isopentane 0.4 ppm to 25.0 ppm v/v (0.4 ppm mole to 26.2 ppm mole)</li> <li>- Normal pentane 0.4 ppm to 25.0 ppm v/v (0.4 ppm mole to 26.6 ppm mole)</li> <li>- Hexane plus 0.4 ppm to 25.0 ppm v/v</li> </ul>	<ul style="list-style-type: none"> <li>- WI-LAB 08 based on International Society of Beverage Technologists, 2019, procedure 10.0</li> </ul>

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Petrochemicals field  1.Liquid carbon dioxide (cont.)	<ul style="list-style-type: none"> <li>- Acetaldehyde 0.1 ppm to 5.0 ppm v/v (0.1 ppm mole to 5.2 ppm mole)</li> <li>- Benzene 5.0 ppb to 50.0 ppb v/v (5.4 ppb mole to 53.6 ppb mole)</li> <li>- Hydrogen sulfide 0.1 ppm to 1.0 ppm v/v (0.1 ppm mole to 1.0 ppm mole)</li> <li>- Carbonyl sulfide 0.05 ppm to 1.0 ppm v/v (0.05 ppm mole to 1.0 ppm mole)</li> <li>- Dimethyl disulfide 0.05 ppm to 1.0 ppm v/v (0.06 ppm mole to 1.1 ppm mole)</li> <li>- Oxygen 0.7 ppm to 5.0 ppm v/v (0.7 ppm mole to 5.0 ppm mole)</li> <li>- Nitrogen 1.0 ppm to 9.0 ppm v/v (1.0 ppm mole to 9.0 ppm mole)</li> <li>- Carbon monoxide 0.5 ppm to 6.0 ppm v/v (0.5 ppm mole to 6.0 ppm mole)</li> </ul>	<ul style="list-style-type: none"> <li>- WI-LAB05 based on International Society of Beverage Technologists, 2019, procedure 11.0</li> <li>- WI-LAB03 based on International Society of Beverage Technologists, 2019, procedure 12.0</li> <li>- WI-LAB04 based on International Society of Beverage Technologists, 2019, procedure 13.0</li> <li>- WI-LAB06 based on ASTM D8098-17</li> </ul>

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Petrochemicals field  2.Gaseous carbon dioxide	<ul style="list-style-type: none"> <li>- Acetaldehyde 0.1 ppm to 5.0 ppm v/v (0.1 ppm to 5.2 ppm mol)</li> <li>- Benzene 5.0 ppb to 50.0 ppb v/v (5.4 ppb to 53.6 ppb mol)</li> <li>- Hydrogen sulfide 0.1 ppm to 1.0 ppm v/v (0.1 ppm mole to 1.0 ppm mole)</li> <li>- Carbonyl sulfide 0.05 ppm to 1.0 ppm v/v (0.05 ppm mole to 1.0 ppm mole)</li> <li>- Dimethyl disulfide 0.05 ppm to 1.0 ppm v/v (0.06 ppm mole to 1.1 ppm mole)</li> <li>- Oxygen 0.7 ppm to 5.0 ppm v/v (0.7 ppm mole to 5.0 ppm mole)</li> <li>- Nitrogen 1.0 ppm to 9.0 ppm v/v (1.0 ppm mole to 9.0 ppm mole)</li> <li>- Carbon monoxide 0.5 ppm to 6.0 ppm v/v (0.5 ppm mole to 6.0 ppm mole)</li> </ul>	<ul style="list-style-type: none"> <li>- WI-LAB05 based on International Society of Beverage Technologists, 2019, procedure 11.0</li> <li>- WI-LAB03 based on International Society of Beverage Technologists, 2019, procedure 12.0</li> <li>- WI-LAB04 based on International Society of Beverage Technologists, 2019, procedure 13.0</li> <li>- WI-LAB06 based on ASTM D8098-17</li> </ul>

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Ministry of Industry, Thai Industrial Standard Institute

Translate Note: In the event of doubt or misunderstanding, the original in Thai shall be the authoritative.

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Petrochemicals field  3. Gaseous carbon monoxide	<ul style="list-style-type: none"> <li>- Hydrogen sulfide 0.1 ppm to 1.0 ppm v/v (0.1 ppm mole to 1.0 ppm mole)</li> <li>- Carbonyl sulfide 0.05 ppm to 1.0 ppm v/v (0.05 ppm mole to 1.0 ppm mole)</li> <li>- Dimethyl disulfide 0.05 ppm to 1.0 ppm v/v (0.06 ppm mole to 1.1 ppm mole)</li> <li>- Carbon dioxide 0.5 ppm to 6.0 ppm v/v (0.5 ppm mole to 6.0 ppm mole)</li> <li>- Oxygen 0.7 ppm to 5.0 ppm v/v (0.7 ppm mole to 5.0 ppm mole)</li> <li>- Nitrogen 1.0 ppm to 9.0 ppm v/v (1.0 ppm mole to 9.0 ppm mole)</li> </ul>	<ul style="list-style-type: none"> <li>- WI-LAB04 based on International Society of Beverage Technologists, 2019, procedure 13.0</li> <li>- WI-LAB06 based on ASTM D8098-17</li> </ul>
4. Gaseous and liquid oxygen	<ul style="list-style-type: none"> <li>- Carbon dioxide 0.5 ppm to 6.0 ppm v/v (0.5 ppm mole to 6.0 ppm mole)</li> <li>- Nitrogen 1.0 ppm to 9.0 ppm v/v (1.0 ppm mole to 9.0 ppm mole)</li> <li>- Carbon monoxide 0.5 ppm to 6.0 ppm v/v (0.5 ppm mole to 6.0 ppm mole)</li> </ul>	<ul style="list-style-type: none"> <li>- WI-LAB06 based on ASTM D8098-17</li> </ul>

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Petrochemicals field  5. Gaseous and liquid Nitrogen	<ul style="list-style-type: none"> <li>- Carbon dioxide 0.5 ppm to 6.0 ppm v/v (0.5 ppm mole to 6.0 ppm mole)</li> <li>- Oxygen 0.7 ppm to 5.0 ppm v/v (0.7 ppm mole to 5.0 ppm mole)</li> <li>- Carbon monoxide 0.5 ppm to 6.0 ppm v/v (0.5 ppm mole to 6.0 ppm mole)</li> </ul>	<ul style="list-style-type: none"> <li>- WI-LAB06 based on ASTM D8098-17</li> </ul>
6. Gaseous and liquid Argon	<ul style="list-style-type: none"> <li>- Carbon dioxide 0.5 ppm to 6.0 ppm v/v (0.5 ppm mole to 6.0 ppm mole)</li> <li>- Oxygen 0.7 ppm to 5.0 ppm v/v (0.7 ppm mole to 5.0 ppm mole)</li> <li>- Nitrogen 1.0 ppm to 9.0 ppm v/v (1.0 ppm mole to 9.0 ppm mole)</li> <li>- Carbon monoxide 0.5 ppm to 6.0 ppm v/v (0.5 ppm mole to 6.0 ppm mole)</li> </ul>	<ul style="list-style-type: none"> <li>- WI-LAB06 based on ASTM D8098-17</li> </ul>

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Petrochemicals field 7. Gaseous Hydrogen	<ul style="list-style-type: none"><li>- Carbon dioxide 0.5 ppm to 6.0 ppm v/v (0.5 ppm mole to 6.0 ppm mole)</li><li>- Oxygen 0.7 ppm to 5.0 ppm v/v (0.7 ppm mole to 5.0 ppm mole)</li><li>- Nitrogen 1.0 ppm to 9.0 ppm v/v (1.0 ppm mole to 9.0 ppm mole)</li><li>- Carbon monoxide 0.5 ppm to 6.0 ppm v/v (0.5 ppm mole to 6.0 ppm mole)</li></ul>	WI-LAB06 based on ASTM D8098-17

Issue date 27<sup>th</sup> May B.E. 2564 (2021)

(Signature)

(Mr. Ekanit Romyanon)

Director

Office of the National Standardization Council  
For Secretary – General Thai Industrial Standards Institute