



# CERTIFICATE OF ACCREDITATION

*This is to attest that*

## **AIR LIQUIDE INDIA SPECIALITY GASES PRIVATE LIMITED**

N 163 MIDC TARAPUR NEAR KUMBHVLI NAKA  
BOISAR, MH 401506, REPUBLIC OF INDIA

**Testing Laboratory TL-1147**

has met the requirements of AC89, *IAS Accreditation Criteria for Testing Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories*. This organization is accredited to provide the services specified in the scope of accreditation.

Effective Date March 27, 2024



A handwritten signature in black ink, reading "Raj Nathan".

**President**

Visit [www.iasonline.org](http://www.iasonline.org) for current accreditation information.

# SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | [www.iasonline.org](http://www.iasonline.org)

## AIR LIQUIDE INDIA SPECIALITY GASES PRIVATE LIMITED

**Contact Name** Padmakar Tillu

**Contact Phone** +91-9967890077

*Accredited to ISO/IEC 17025:2017*

*Effective Date March 27, 2024*

| TM005/TA   | NATURAL GAS Composition, Range of Measurement, % mol/mol  |             |
|--|---|-------------|
|  | Amount fraction   | (% mol/mol) |
|  | Nitrogen  | 0.1 to 12   |
|  | carbon dioxide  | 0.05 to 8   |
|  | Methane   | 64 to 100   |
|  | Ethane  | 0.1 to 14   |
|  | Propane   | 0 to 8      |
|  | iso-butane  | 0 to 1.2    |
|  | n-butane  | 0 to 1.2    |
|  | neo-pentane   | 0 to 0.35   |
|  | iso-pentane   | 0 to 0.35   |
|  | n-pentane   | 0 to 0.35   |
|  | 2-methyl pentane  | 0 to 0.35   |
|  | 3-methyl pentane  | 0 to 0.35   |
|  | 2,2-dimethylbutane  | 0 to 0.35   |
|  | n-hexane  | 0 to 0.35   |
|  | hexanes (1)   | 0 to 0.35   |
|  | Benzene   | 0 to 0.2    |
|  | cyclohexane   | 0 to 0.2    |
|  | n-heptane   | 0 to 0.2    |
|  | heptanes (1)  | 0 to 0.2    |
|  | Toluene   | 0 to 0.1    |
|  | methylcyclohexane   | 0 to 0.1    |
|  | n-octane  | 0 to 0.05   |
|  | octanes (1)   | 0 to 0.05   |
|  | n-nonane  | 0 to 0.02   |
|  | nonanes (1)   | 0 to 0.02   |
|  | n-decane  | 0 to 0.005  |
|  | decanes (1)   | 0 to 0.005  |
|  | Oxygen  | 0 to 1      |
| <b>Gas Mixture Properties</b><br>(Calculated Values from composition)    | <b>In-house method TM005/TA</b>   |             |
| Superior calorific value<br>Inferior calorific value<br>Relative density | Values calculated by ISO 6976:1995 (including amendment No. 1, May 1998) on a real or ideal gas basis assuming the mixture is dry (free from water) |             |

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|   |  |
|---|--|
| Density<br>Superior Wobbe index<br>Inferior Wobbe index<br>Molar mass<br>Compression factor   | Combustion properties can be expressed in units of the Joule (J) or in kilowatt hours (kWh)  |
| gross calorific value<br>net calorific value<br>relative density<br>density<br>gross Wobbe index<br>net Wobbe index<br>molar mass<br>compression factor | Values calculated by ISO 6976:2016 on a real or ideal gas basis assuming the mixture is dry (free from water)<br><br>Combustion properties can be expressed in units of the Joule (J) or in kilowatt hours (kWh) |
| gross heating value<br>net heating value<br>relative density<br>compressibility factor  | Calculated values according to methods given in GPA-2172-09 (2009) using data table from GPA 2145-09   |
| gross heating value<br>net heating value<br>relative density<br>compressibility factor  | Calculated values according to methods given in ASTM D3588-98 (2011) using data tables from GPA 2145-09 using data table from GPA 2145-09  |