

ISO 6976:2016-08 (E)

Natural gas - Calculation of calorific values, density, relative density and Wobbe indices from composition

| Contents | | Page |
|--------------------|--------------------------------------------------------|-------------|
| Foreword | | v |
| Introduction | | vi |
| 1 | Scope | 1 |
| 2 | Normative references | 2 |
| 3 | Terms and definitions | 2 |
| 4 | Symbols and units | 5 |
| 4.1 | Quantities | 5 |
| 4.2 | Subscripts | 6 |
| 4.3 | Superscript | 6 |
| 5 | Principles | 6 |
| 6 | Behaviour of ideal and real gases | 7 |
| 6.1 | Enthalpy of combustion | 7 |
| 6.2 | Calculation of compression factor | 8 |
| 7 | Calculation of calorific value on a molar basis | 8 |
| 7.1 | Gross calorific value | 8 |
| 7.2 | Net calorific value | 9 |
| 8 | Calculation of calorific value on a mass basis | 9 |
| 8.1 | Gross calorific value | 9 |
| 8.2 | Net calorific value | 10 |
| 9 | Calculation of calorific value on a volume basis | 10 |
| 9.1 | Ideal-gas gross calorific value | 10 |
| 9.2 | Ideal-gas net calorific value | 10 |
| 9.3 | Real-gas gross calorific value | 11 |
| 9.4 | Real-gas net calorific value | 11 |
| 10 | Calculation of associated properties | 11 |
| 10.1 | Ideal-gas relative density | 11 |
| 10.2 | Ideal-gas density | 12 |
| 10.3 | Ideal-gas gross Wobbe index | 12 |
| 10.4 | Ideal-gas net Wobbe index | 12 |
| 10.5 | Real-gas relative density | 13 |
| 10.6 | Real-gas density | 13 |
| 10.7 | Real-gas gross Wobbe index | 13 |
| 10.8 | Real-gas net Wobbe index | 14 |
| 11 | Uncertainty of calculation | 14 |
| 11.1 | Principles | 14 |
| 11.2 | Formulae for the analytical method | 15 |
| 11.3 | Inputs for the analytical method | 15 |
| 11.3.1 | Composition and compositional uncertainties | 15 |
| 11.3.2 | Non-compositional inputs | 16 |

| | | |
|-----------------------------------------------------------------|----------------------------------|----|
| 11.4 | Expanded uncertainty | 17 |
| 11.5 | Expression of results | 17 |
| 11.5.1 | General | 17 |
| 11.5.2 | Analytical method | 17 |
| 11.5.3 | Generic method | 17 |
| 11.5.4 | Contingency method | 17 |
| 11.6 | Application of uncertainty | 18 |
| 12 | Tables of data | 19 |
| Annex A (normative) Values of auxiliary constants | | 25 |
| Annex B (normative) Formulae for uncertainty calculations | | 27 |
| Annex C (informative) Conversion factors | | 32 |
| Annex D (informative) Example calculations | | 34 |
| Bibliography | | 57 |