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Natural gas — Calculation of methane number

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National foreword

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
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Foreword

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The committee responsible for this document is ISO/TC 193, *Natural Gas*.

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Natural gas — Calculation of methane number

1 Scope

This Technical Report describes methods for the calculation of the methane number (*MN*) of dry natural gas when the composition of the gas by mole fraction is known.

If the difference of *MN* between two calculation methods is more than 6, it is recommended to use a test method to determine *MN* for the gas.

The Gas Research Institute (GRI) methods are used to calculate methane number, *MN*, and motor octane number, *MON*, of gas; the linear relation is useful in determining and comparing the knock resistance of high methane content natural gas.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1
methane number
MN
measure of resistance of a gas fuel to knock, which is assigned to a test fuel based upon operation in knock testing unit at the same standard knock intensity

Note 1 to entry: It is assigned that pure methane is used as the knock resistant reference fuel, that is, methane number of pure methane is 100, and pure hydrogen is used as the knock sensitive reference fuel, methane number of pure hydrogen is 0.

2.2
motor octane number
MON
numerical rating of knock resistance obtained by comparison of its knock intensity with that of primary reference fuels when both are tested in a standardized CFR engine operating under the specified conditions

3 Calculation methods of methane number

3.1 GRI methods

The GRI has applied the ASTM octane rating method to various natural gas fuels (see Annex A) to measure *MON*. Two mathematical relations were developed to estimate the *MON* rating of a natural gas fuel. The limitation of each component is shown in Table A.2.

3.1.1 Linear coefficient relation

$$MON = 137{,}78_{x1} + 29{,}948_{x2} - 18{,}193_{x3} - 167{,}062_{x4} + 181{,}233_{x5} + 26{,}994_{x6} \quad (1)$$

where

x is the mole fraction of corresponding component.

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