

DIN EN ISO 20765-1:2018-12 (E)

Natural gas - Calculation of thermodynamic properties - Part 1: Gas phase properties for transmission and distribution applications (ISO 20765-1:2005)

Contents		Page
European foreword		3
Foreword		4
Introduction		5
1	Scope	6
2	Normative references	6
3	Terms and definitions	6
4	Thermodynamic basis of the method	7
4.1	Principle	7
4.2	The fundamental equation of Helmholtz free energy	8
4.3	Thermodynamic properties derived from the Helmholtz free energy	10
5	Method of calculation	13
5.1	Input variables	13
5.2	Conversion from pressure to reduced density	14
5.3	Implementation	14
6	Ranges of application	15
6.1	Pressure and temperature	15
6.2	Pipeline quality gas	15
7	Uncertainty	16
7.1	Uncertainty for pipeline quality gas	16
7.2	Impact of uncertainties of input variables	19
8	Reporting of results	19
	Annex A (normative) Symbols and units	21
	Annex B (normative) The Helmholtz free energy of the ideal gas	24
	Annex C (normative) The equation for the Helmholtz free energy	27
	Annex D (normative) Detailed documentation for the equation of state	29
	Annex E (informative) Assignment of trace components	35
	Annex F (informative) Implementation of the method	37
	Annex G (informative) Examples	40
	Bibliography	47