

## ANNEX 10A

### TECHNICAL SPECIFICATION ON THE CHEMICAL-PHYSICAL CHARACTERISTICS OF NATURAL GAS

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**10A.1 COMPONENTS OF HHV**

The components of natural gas used for purposes of measuring HHV are listed below.

Component	Acceptability values	Unit of measure
Methane	(*)	
Ethane	(*)	
Propane	(*)	
Isobutane	(*)	
Normal butane	(*)	
Isopentane	(*)	
Normal pentane	(*)	
Hexanes and higher	(*)	
Nitrogen	(*)	
Carbon dioxide	$\leq 3$	% mol

(\*) for these components the acceptability values are intrinsically limited by the Wobbe Index acceptability field.

**10A.2 QUALITY CONTROL PARAMETERS**

Parameters	Acceptability values	Unit of measure
Hydrogen sulphide	$\leq 6.6$	mg/Sm <sup>3</sup>
Mercaptan sulphur	$\leq 15.5$	mg/Sm <sup>3</sup>
Total sulphur	150	mg/Sm <sup>3</sup>
Higher Heating Value	34.95÷45.28	MJ/Sm <sup>3</sup>
Wobbe Index	47.31÷52.33	MJ/Sm <sup>3</sup>
Relative density	0.5548÷0.8	
Oxygen	< 0.6	% mol
Water dew point (a)	$\leq -5$	°C
Hydrocarbon dew point (b)	$\leq 0$	°C
Max temperature	$\leq 50$	°C

(a) at pressure of 7.000 kPa

(b) in the pressure field of 100÷7000 kPa

### 10A.3 OTHER PROPERTIES

Under operating conditions, Gas must not contain traces of the components listed below:

- a) Water and hydrocarbons in liquid form;
- b) Solid particulate matter in quantities that could cause damage to the materials used in gas transport;
- c) Other elements that could affect the safety or integrity of the transport system.

### 10A.4 PERTINENT LAWS

- a) CNR-UNI 1003 “International System of Units (SI)”;
- b) Ministerial Decree of 24 November 1984 “Fire safety regulations for the transport, distribution, storage, and use of natural gas with a density not exceeding 0.8”;
- c) UNI EN 437 “Test gas – Test pressure – Equipment categories”;
- d) ISO 13443 “Natural gas – Standard reference conditions”;
- e) Resolution no. 185/05 of 6 September 2005 by Regulatory Authority;
- f) Decree of 19 February 2007 “Approval of technical rule on the chemical-physical characteristics and the presence of other components in combustible gas to be conveyed”.

### 10A.5 REFERENCE CONDITIONS

The reference conditions of the units of volume adopted herein are the standards, that is, (ref. ISO 13443):

<i>Pressure</i>	<i>101.325 kPa</i>
<i>Temperature</i>	<i>288.15 K (= 15°C)</i>

For calculating Higher Heating Value and the Wobbe Index, the following enthalpy reference is assumed:

*288.15 K (= 15 °C) ; 101.325 kPa*