



NET4GAS, s.r.o

COMPRESSOR STATION JIRKOV 73 BAR

COMPOSITION OF PROCESS GAS

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Annex 1
Attachment 1.6

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1 GENERAL

1.1 Scope of the Document

This document shall define the process gas composition and the range of components to be expected at the inlet of CS Jirkov as specified by NET4GAS. It shall be taken into consideration when performing process calculations regarding

- compression of process gas,
- venting of process gas and
- utilization of process gas as fuel gas within CS Jirkov

and for the material selection of the process equipment.

1.2 Definitions

Term	Explanation
Project	Compressor Station Jirkov 73 bar
Employer	NET4GAS
Consultant	ILF Consulting Engineers

1.3 Abbreviations

Term	Explanation
CS	Compressor Station
N4G	NET4GAS

1.4 References

No.	Number	Title
1		
2		
3		

1.5 Codes and Standards

No.	Number	Title
1		
2		
3		

2 GAS COMPOSITION AND RANGE

2.1 Typical Gas Composition

Typical Gas Composition and general gas data is considered as follows :

	Unit	Brandov import (OPAL)	Olbernhau II
Methane	% mol	96,6904	96,6232
Ethane	% mol	2,2435	2,0460
Propane	% mol	0,1920	0,3616
iso-Butane	% mol	0,0465	0,0629
n-Butane	% mol	0,0296	0,0546
neo-Pentane	% mol	0,0021	0,0000
iso-Pentane	% mol	0,0059	0,0095
n-Pentane	% mol	0,0043	0,0066
n-Hexane + C6+	% mol	0,0100	0,0115
Oxygen	ppm	0,32	0,59
Carbon Dioxide	% mol	0,2845	0,1847
Nitrogen	% mol	0,4897	0,6400
Mercaptan Sulphur (RSH)	mgS/m ³	0,00	0,01
Hydrogen Sulphide (H ₂ S) and Carbonyl Sulphide (COS)	mgS/m ³	0,00	0,01
Total Sulphur	mgS/m ³	0,00	0,01
Wobbe index *	kWh/m ³	14,815	14,827
Gross Calorific Value *	kWh/m ³	11,225	11,243

Net Calorific Value *	kWh/m ³	10,124	10,141
Relative density		0,5741	0,5752
Gas density	kg/m ³	0,7423	0,7436
Molecular weight	g/mol	16,5951	16,6256
Water (H ₂ O) dew point (40 bar)	°C	-26,0	-19,3
Hydrocarbons (C _x H _y) dew point	°C	-13,3	-8,4

Standard pressure bar abs 1.01325

Standard temperature °C 25

Fluid state GAS

2.2 Extreme Gas Composition

Extreme Gas Composition is based on N4G transport conditions (see 2.3)

Component	Mol-Fraction
Methane CH ₄	85.0%
Ethane C ₂ H ₆	7.0%
Propane C ₃ H ₈	3.0%
Butane-C ₄ H ₁₀	2.0%
C ₅ +	0.5%
Nitrogen N ₂	1.59%
Carbon Dioxide CO ₂	0.89%
Oxygen O ₂	0.02%
Water H ₂ O	See 2.3.2
Hydrogen Sulfide H ₂ S	See 2.3

Mercaptan Sulphur RSH	See 2.3
Total Sulphur	See 2.3
SUM	100.00%

Table 2 - 1 Extreme Gas Composition (transport condition N4G)

2.3 Gas Quality Range

The gas quality range at the entry of the CS Jirkov is defined with the following chemical and physical parameters acc. N4G transport conditions:

2.3.1 Chemical Composition

Constituent	%mol
Methane	min. 85%
Ethane	max. 7%
Propane	max. 3%
Sum of Butanes	max. 2%
Sum of Pentanes and higher hydrocarbons	max. 0.5%
Oxygen	max. 0.02%
Nitrogen	max. 5%
Carbon dioxide	max. 3%
Hydrogen sulphide (H ₂ S)	max. 6 mg/m ³
Mercaptan sulphur (RSH)	max. 5 mg/m ³
Total sulphur	max. 30 mg/m ³
Wobbe number	min. 12.7 kWh/m ³ (45.7 MJ/m ³) max. 14.5 kWh/m ³ (52.2 MJ/m ³)
Relative density	min. 0.56 max. 0.70
Gross Calorific Value (Real Gross Dry)	min. 9.4 kWh/m ³ (33.8 MJ/m ³) max. 11.8 kWh/m ³ (42.5 MJ/m ³)

Related to normal conditions $t_2 = 15\text{ °C}$ and $p = 101.325\text{ kPa}$ and temperature of flue gases $t_1 = 15\text{ °C}$, for dry gas - relative humidity $\phi = 0$, gas containing no water vapour.

2.3.2 Water Dew Point

Water dew point max. -7 °C at 4 MPa

2.3.3 Hydrocarbons Dew Point

Hydrocarbons dew point max. 0 °C at 1.7 MPa

2.4 Gas Impurities, Liquids and Solids

The gas is filtered and subsequently pressure reduced within the BTS HSK with Node Katerinsky potok about 20 km upstream of the CS Jirkov, or few km upstream of the border to Germany.

Potential impurities might be expected at start up after commissioning of the CS Jirkov and during operation from the pipeline section between the BTS HSK and the CS inlet.

Free liquids are expected only due to pressure testing within the CS.