

ACCESS CODE FOR TRANSMISSION



Attachment C.4: Specific requirements at Connection Points

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1 Operating Conditions and quality requirements at IZT and Zeebrugge

	Unit	Min.	Max.
Gross Calorific Value	kWh/m³ (n) (25°C, 0°C)	10.80	12.38
Wobbe Index	kWh/m3 (n) (25°C, 0°C)	13.82(3)	15.05
Pressure ⁽¹⁾	barg	55	80
Temperature	°C	2	38
Hydrocarbon dewpoint	°C from 0 to 69 barg		Minus 2
Water dewpoint	°C at 69 barg		Minus 8 ⁽²⁾
Oxygen content (O2)	ppm by vol		1000
Carbon dioxide content (CO2)	Mole %		2.5
Hydrogen sulphide content (H ₂ S) (inclusive of COS) (as S)	mg/m3(n) (as S)		5
Total sulphur at any time (as S)	mg/m3(n) (as S)		30
Mercaptans (as S)	mg/m3(n) (as S)		6

- (1) Natural gas shall be made available in the entry direction at any pressure within this range as requested from time to time by Fluxys
- (2) As long as the maximum water dewpoint applicable in the IUK system is -10°C at 69 barg, said value shall be applicable.
- (3) 13.69 kWh/m³ as from the 1st of February 2023, subject to a prior notice of 4 weeks.

 Postponed to a later date because of delays at the UK-side, new date when it comes into effect will be communicated at least 4 weeks in advance.

The Natural Gas delivered may not contain any other elements or impurities (such as, but not limited to methanol, condensates and gas odorants) to the extent that the Natural Gas delivered cannot be transported, stored or marketed in Belgium without incurring additional cost for quality adjustment.

The Natural Gas delivered may not contain any added odorants.



2 Operating Conditions and quality requirements at ZPT

	Unit	Min.	Max.
Gross Calorific Value	kWh/m³ (n) (25°C, 0°C)	11.17	12.77
Wobbe Index	kWh/m3 (n) (25°C, 0°C)	14.17	15.47(1)
Pressure ⁽²⁾	barg	45	80
Temperature	°C	2	30(Oct-May) 32 (June- Sept)
Hydrocarbon dewpoint	°C from 0 to 69 barg		Minus 2
Water dewpoint	°C at 69 barg		Minus 10
Oxygen content (O2)	ppm by vol		1000
Carbon dioxide content (CO2)	Mole %		2.5
Hydrogen sulphide content (H ₂ S) (inclusive of COS) (as S)	mg/m3(n) (as S)		5
Total sulphur at any time (as S)	mg/m3(n) (as S)		30
Mercaptans (as S)	mg/m3(n) (as S)		6

- (1) For redeliveries of Natural Gas at IZT/Zeebrugge, we refer to ACT Attachment C1.
- (2) Natural gas shall be made available at any pressure within this range as requested from time to time by Fluxys

The Natural Gas delivered may not contain any other elements or impurities (such as, but not limited to methanol, condensates and gas odorants) to the extent that the Natural Gas delivered cannot be transported, stored or marketed in Belgium without incurring additional cost for quality adjustment.

The Natural Gas delivered may not contain any added odorants.



3 Operating Conditions and quality requirements at VIP THE-ZTP

	Unit	Min.	Max.
Gross Calorific Value	kWh/m³ (n) (25°C, 0°C)	10.80	12.77
Wobbe Index	kWh/m3 (n) (25°C, 0°C)	13.82(4)	15.47(1)
Pressure ⁽²⁾	barg	49 exit 55 entry	80
Temperature	°C	2	38
Hydrocarbon dewpoint	°C from 0 to 69 barg		Minus 2
Water dewpoint ⁽³⁾	°C at 69 barg		Minus 8
Oxygen content (O2)	ppm by vol		1000
Carbon dioxide content (CO2)	Mole %		2.5
Hydrogen sulphide content (H ₂ S) (inclusive of COS) (as S)	mg/m3(n) (as S)		5
Total sulphur at any time (as S)	mg/m3(n) (as S)		30
Mercaptans (as S)	mg/m3(n) (as S)		6

- (1) For redeliveries of Natural Gas at IZT/Zeebrugge, we refer to ACT Attachment C1.
- (2) Natural gas shall be made available in the entry direction at any pressure within this range as requested from time to time by Fluxys
- (3) As long as the maximum water dewpoint applicable in the IUK system is -10°C at 69 barg, said value shall be applicable
- (4) 13.69 kWh/m³ as from the 1st of February 2023, subject to a prior notice of 4 weeks. Postponed to a later date because delays at the UK-side, new date when it comes into effect will be communicated at least 4 weeks in advance.

The Natural Gas delivered may not contain any other elements or impurities (such as, but not limited to methanol, condensates and gas odorants) to the extent that the Natural Gas delivered cannot be transported, stored or marketed in Belgium without incurring additional cost for quality adjustment.

The Natural Gas delivered may not contain any added odorants.



4 Operating Conditions and quality requirements at Virtualys

	Unit	Min.	Max.
Gross Calorific Value	kWh/m3 (n) (25°C, 0°C)	10.80	12.77
Wobbe Index	kWh/m3 (n) (25°C, 0°C)	13.82(2)	15.47(1)
Temperature	°C	2	38
Hydrocarbon dewpoint	°C from 0 to 69 barg		Minus 2
Water dewpoint	°C at 69 barg		Minus 8
Oxygen content (O2)	ppm by vol		1000
Carbon dioxide content (CO2)	Mole %		2.5
Hydrogen sulphide content (H ₂ S) (inclusive of COS) (as S)	mg/m3(n) (as S)		5
Total sulphur at any time (as S)	mg/m3(n) (as S)		30
Mercaptans (as S)	mg/m3(n) (as S)		6

- (1) For redeliveries of Natural Gas at IZT/Zeebrugge, we refer to ACT Attachment C1.
- (2) 13.69 kWh/m³ as from the 1st of February 2023, subject to a prior notice of 4 weeks. Postponed to a later date because delays at the UK-side, new date when it comes into effect will be communicated at least 4 weeks in advance.

The Natural Gas delivered may not contain any other elements or impurities (such as, but not limited to methanol, condensates and gas odorants) to the extent that the Natural Gas delivered cannot be transported, stored or marketed in Belgium without incurring additional cost for quality adjustment.

The Natural Gas delivered may not contain any added odorants.



5 Operating Conditions and quality requirements at GDLux

	Unit	Min.	Max.
Gross Calorific Value	kWh/m³ (n) (25°C, 0°C)	10.80	12.77
Wobbe Index	kWh/m3 (n) (25°C, 0°C)	13.82(2)	15.47(1)
Pressure	barg	27	66.2
Temperature	%	2	38
Hydrocarbon dewpoint	°C from 0 to 69 barg		Minus 2
Water dewpoint	°C at 69 barg		Minus 10
Oxygen content (O2)	ppm by vol		1000
Carbon dioxide content (CO2)	Mole %		2.5
Hydrogen sulphide content (H ₂ S) (inclusive of COS) (as S)	mg/m3(n) (as S)		5
Total sulphur at any time (as S)	mg/m3(n) (as S)		30
Mercaptans (as S)	mg/m3(n) (as S)		6

- (1) For redeliveries of Natural Gas at IZT/Zeebrugge, we refer to ACT Attachment C1.
- (2) 13.69 kWh/m³ as from the 1st of February 2023, subject to a prior notice of 4 weeks. <u>Postponed</u> to a later date because delays at the UK-side, new date when it comes into effect will be communicated at least 4 weeks in advance.

The Natural Gas delivered may not contain any other elements or impurities (such as, but not limited to methanol, condensates and gas odorants) to the extent that the Natural Gas delivered cannot be transported, stored or marketed in Belgium without incurring additional cost for quality adjustment.

The Natural Gas delivered may not contain any added odorants.



6 Operating Conditions and quality requirements at VIP-BENE

	Unit	Min.	Max.
Gross Calorific Value	kWh/m³ (n) (25°C, 0°C)	10.80	12.77
Wobbe Index	kWh/m3 (n) (25°C, 0°C)	13.82(2)	15.47(1)
Pressure IP s' Gravenvoeren IP Zandvliet H IP Zelzate 1 IP Zelzate 2	barg	49 55 59 55	66.2 80 80 80
Temperature	°C	2	38
Hydrocarbon dewpoint	°C from 0 to 69 barg		Minus 2
Water dewpoint	°C at 69 barg		Minus 8
Oxygen content (O2)	ppm by vol		1000
Carbon dioxide content (CO2)	Mole %		2.5
Hydrogen sulphide content (H ₂ S) (inclusive of COS) (as S)	mg/m3(n) (as \$)		5
Total sulphur at any time (as S)	mg/m3(n) (as \$)		30
Mercaptans (as S)	mg/m3 (n)		6

(1) For redeliveries of Natural Gas at IZT/Zeebrugge, we refer to ACT - Attachment C1.

The Natural Gas redelivered may not contain other elements and impurities (such as but not limited to methanol, condensates, gas odorants) to the extent that the Natural Gas redelivered cannot be transported, stored and marketed in Belgium without incurring additional cost for quality adjustment

The Natural Gas delivered may not contain any added odorants.



^{(2) 13.69} kWh/m³ as from the 1st of February 2023, subject to a prior notice of 4 weeks. <u>Postponed</u> to a later date because delays at the UK-side, new date when it comes into effect will be communicated at least 4 weeks in advance.

7 Operating Conditions and quality requirements at Hilvarenbeek L

	Unit	Min.	Max.
Gross Calorific Value	kWh/m³ (n) (25°C, 0°C)	9.53	10.74
Wobbe Index	kWh/m3 (n) (25°C, 0°C)	12.20(1)	13.02
Pressure	barg	49	66.2
Temperature	°C	2	38
Hydrocarbon dewpoint	°C from 0 to 69 barg		Minus 2
Water dewpoint	°C at 69 barg		Minus 8
Oxygen content (O2)	ppm by vol		1000
Carbon dioxide content (CO2)	Mole %		2.5
Hydrogen sulphide content (H ₂ S) (inclusive of COS) (as S)	mg/m3(n) (as S)		5
Total sulphur at any time (as S)	mg/m3(n) (as \$)		30
Mercaptans (as S)	mg/m3 (n)		6

(1) This value will be lowered in agreement with the adjacent operator, subject to compliance with the range and values of the Belgian legislation as in effect at that time

The Natural Gas redelivered may not contain other elements and impurities (such as but not limited to methanol, condensates, gas odorants) to the extent that the Natural Gas redelivered cannot be transported, stored and marketed in Belgium without incurring additional cost for quality adjustment

The Natural Gas delivered may not contain any added odorants.



8 Operating Conditions and quality requirements at Blaregnies L

	Unit	Min.	Max.
Gross Calorific Value	kWh/m³ (n) (25°C, 0°C)	9.53	10.74
Wobbe Index	kWh/m3 (n) (25°C, 0°C)	12.20	13.02
Pressure	barg	49	66.2
Temperature	°C	2	38
Hydrocarbon dewpoint	°C from 0 to 69 barg		Minus 2
Water dewpoint	°C at 69 barg		Minus 8
Oxygen content (O2)	ppm by vol		1000
Carbon dioxide content (CO2)	Mole %		2.5
Hydrogen sulphide content (H ₂ S) (inclusive of COS) (as S)	mg/m3(n) (as \$)		5
Total sulphur at any time (as S)	mg/m3(n) (as \$)		30
Mercaptans (as S)	mg/m3 (n)		6

The Natural Gas redelivered may not contain other elements and impurities (such as but not limited to methanol, condensates, gas odorants) to the extent that the Natural Gas redelivered cannot be transported, stored and marketed in Belgium without incurring additional cost for quality adjustment

The Natural Gas delivered may not contain any added odorants.

9 Operating Conditions and quality requirements at Zeebrugge LNG Terminal

	Unit	Min.	Max.
Gross Calorific Value	kWh/m³ (n) (25°C, 010)	10.80	12.77
Wobbe Index	kWh/m3 (n) (25°C, 0°C)	13.67	15.56(1)
Pressure	barg	55	80
Temperature	°C	2	38
Hydrocarbon dewpoint	°C from 0 to 69 barg		Minus 2
Water dewpoint	°C at 69 barg		Minus 8
Oxygen content (O2)	ppm by vol		1000
Carbon dioxide content (CO2)	Mole %		2.5
Hydrogen sulphide content (H ₂ S) (inclusive of COS) (as S)	mg/m3(n) (as S)		5
Total sulphur at any time (as S)	mg/m3(n) (as S)		30
Mercaptans (as S)	mg/m3(n) (as S)		6

(1) For redeliveries of Natural Gas at IZT/Zeebrugge, we refer to ACT - Attachment C1.

The Natural Gas delivered may not contain any other elements or impurities (such as, but not limited to methanol, condensates and gas odorants) to the extent that the Natural Gas delivered cannot be transported, stored or marketed in Belgium without incurring additional cost for quality adjustment.

The Natural Gas delivered may not contain any added odorants.



10 Operating Conditions and quality requirements at Dunkirk LNG Terminal

	Unit	Min.	Max.
Gross Calorific Value	kWh/m³ (n) (25°C, 0°C)	11.17	12.77
Wobbe Index	kWh/m3 (n) (25°C, 0°C)	14.17	15.47(1)
Pressure	barg	55	84.5
Temperature	°C	2	38
Hydrocarbon dewpoint	°C from 0 to 69 barg		Minus 2
Water dewpoint	°C at 69 barg		Minus 10
Oxygen content (O2)	ppm by vol		1000
Carbon dioxide content (CO2)	Mole %		2.5
Hydrogen sulphide content (H ₂ S) (inclusive of COS) (as S)	mg/m3(n) (as S)		5
Total sulphur at any time (as S)	mg/m3(n) (as S)		30
Mercaptans (as S)	mg/m3(n) (as S)		6

(1) For redeliveries of Natural Gas at IZT/Zeebrugge, we refer to ACT - Attachment C1.

The Natural Gas delivered may not contain any other elements or impurities (such as, but not limited to methanol, condensates and gas odorants) to the extent that the Natural Gas delivered cannot be transported, stored or marketed in Belgium without incurring additional cost for quality adjustment.

The Natural Gas delivered may not contain any added odorants.

11 Operating Conditions and quality requirements at Loenhout

	Unit	Min.	Max.
Gross Calorific Value	kWh/m³ (n) (25°C, 0°C)	10.80	12.77
Wobbe Index	kWh/m3 (n) (25°C, 0°C)	13.82(4)	15.56(1)
Pressure (2)	barg	60	80
Temperature	С	2	38
Hydrocarbon dewpoint	°C from 0 to 69 barg		Minus 2
Water dewpoint	°C at 69 barg		Minus 8
Oxygen content (O2)	ppm by vol		1000
Carbon dioxide content (CO2)	Mole %		2.0(3)
Hydrogen sulphide content (H ₂ S) (inclusive of COS) (as S)	mg/m3(n) (as S)		5
Total sulphur at any time (as S)	mg/m3(n) (as S)		30
Mercaptans (as S)	mg/m3 (n)		6

- (1) For redeliveries of Natural Gas at IZT/Zeebrugge, we refer to ACT Attachment C1.
- (2) A lower minimum pressure can be agreed upon by Fluxys and the Storage Operator in line with the provisions of attachment D.2 of the Access Code for Storage.
- (3) CO₂ content of the Natural Gas injected must on average be lower than 1 Mole % over the Storage Season, as defined in the Access Code for Storage
- (4) 13.69 kWh/m³ as from the 1st of February 2023, subject to a prior notice of 4 weeks.

 Postponed to a later date because delays at the UK-side, new date when it comes into effect will be communicated at least 4 weeks in advance

The Natural Gas redelivered may not contain other elements and impurities (such as but not limited to methanol, condensates, gas odorants) to the extent that the Natural Gas redelivered cannot be transported, stored and marketed in Belgium without incurring additional cost for quality adjustment

The Natural Gas delivered may not contain any added odorants.

12 Operating Conditions and quality requirements at Installation Point H₂-IN, after H₂ injection

	Unit	Min.	Max.
Gross Calorific Value	kWh/m³ (n) (25°C, 0°C)	10.80(1)	12.77
Wobbe Index	kWh/m3 (n) (25°C, 0°C)	13.82(5)	15.47 ⁽²⁾
Hydrocarbon dewpoint	°C from 0 to 69 barg		Minus 2
Water dewpoint	°C at 69 barg		Minus 8 ⁽³⁾
Oxygen content (O2)	ppm by vol		1000
Carbon dioxide content (CO2)	Mole %		2.5
Hydrogen sulphide content (H ₂ S) (inclusive of COS) (as S)	mg/m3(n) (as S)		5
Total sulphur at any time (as S)	mg/m3(n) (as S)		20
Mercaptans (as S)	mg/m3 (n)		6
Hydrogen (H ₂)	Mole %		2(4)

- (1) 10.7 kWh/m3(n) as long as the minimum Gross Calorific Value of 10.8 kWh/m3(n) is respected on Interconnection Points
- (2) 15.05 kWh/m3(n) if injected gas can be redelivered at IZT/Zeebrugge
- (3) Minus 10 °C if injected gas can be redelivered at IZT/Zeebrugge
- (4) As long as applicable H_2 specifications are respected on other Connection Points.
- (5) 13.69 kWh/m³ as from the 1st of February 2023, subject to a prior notice of 4 weeks. Postponed to a later date because delays at the UK-side, new date when it comes into effect will be communicated at least 4 weeks in advance.

The Natural Gas redelivered may not contain other elements and impurities (such as but not limited to methanol, condensates, gas odorants) to the extent that the Natural Gas redelivered cannot be transported, stored and marketed in Belgium without incurring additional cost for quality adjustment

The Natural Gas delivered may not contain any added odorants.

13 Operating Conditions and quality requirements at Domestic Points for Injection

	Unit	Min.	Max.
Gross Calorific Value	kWh/m³ (n) (25°C, 0°C)	10.80(1)	12.77
Wobbe Index	kWh/m3 (n) (25°C, 0°C)	13.82(6)	15.47 ⁽²⁾
Hydrocarbon dewpoint	°C from 0 to 69 barg		Minus 2
Water dewpoint	°C at 69 barg		Minus 8 ⁽³⁾
Oxygen content (O2)	ppm by vol		<u>5</u> +000 ⁽⁴⁾ (7)
Carbon dioxide content (CO2)	Mole %		2.5(4)
Hydrogen sulphide content (H ₂ S) (inclusive of COS) (as S)	mg/m3(n) (as S)		5
Total sulphur at any time (as S)	mg/m3(n) (as S)		20
Mercaptans (as S)	mg/m3 (n)		6
Propane (C ₃ H ₈)	Mole %		3(4)
Hydrogen (H ₂)	Mole %		2(4)(5)

- (1) 10.7 kWh/m3(n) as long as the minimum Gross Calorific Value of 10.8 kWh/m3(n) is respected on Interconnection Points
- (2) 15.05 kWh/m3(n) if injected gas can be redelivered at IZT/Zeebrugge
- (3) Minus 10 °C if injected gas can be redelivered at IZT/Zeebrugge
- (4) Depending on the injection location, Fluxys Belgium shall determine if mitigation measures are needed to reduce Wobbe Index variations in the gas network, when such variations arise from the connection of that specific Domestic Point for Injection.
 - If applicable, the Local Producer shall choose between the available alternatives (reduce O_2 , CO_2 or H_2 specifications, addition of C_3H_8) or choose a combination of such alternatives, to align the Wobbe Index of the gas it produces with the Wobbe Index of the gas circulating in the natural gas network in the vicinity of that Domestic Point for Injection.
- (5) As long as applicable H₂ specifications are respected on other Connection Points
- (6) 13.69 kWh/m³ as from the 1st of February 2023, subject to a prior notice of 4 weeks. Postponed to a later date because delays at the UK-side, new date when it comes into effect will be communicated at least 4 weeks in advance
- (6)(7) Depending on the injection location, Fluxys Belgium shall determine whether lower O2 limits are applicable, in order to protect Loenhout, interconnection points or sensitive customers.

The Natural Gas redelivered may not contain other elements and impurities (such as but not limited to methanol, condensates, gas odorants) to the extent that the Natural Gas redelivered cannot be transported, stored and marketed in Belgium without incurring additional cost for quality adjustment

The Natural Gas delivered may not contain any added odorants.